Coal Age

SEPTEMBER, 1954

A McGRAW-HILL PUBLICATION — PRICE 50c

Peabody No. 10

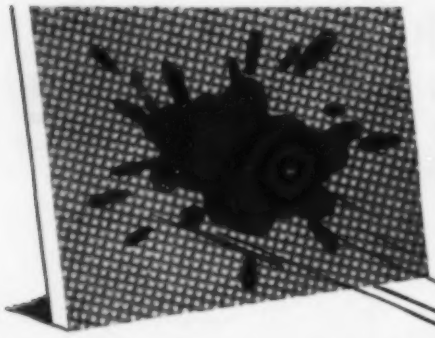
How progressive management, modern methods, and creative thinking team up to get high output per man at new 14,500-tpd mine, p 80

Close-Coupled Strip

Loading coal within 24 hr of stripping takes real planning, top-notch maintenance at Buckeye Coal's mine. p 97

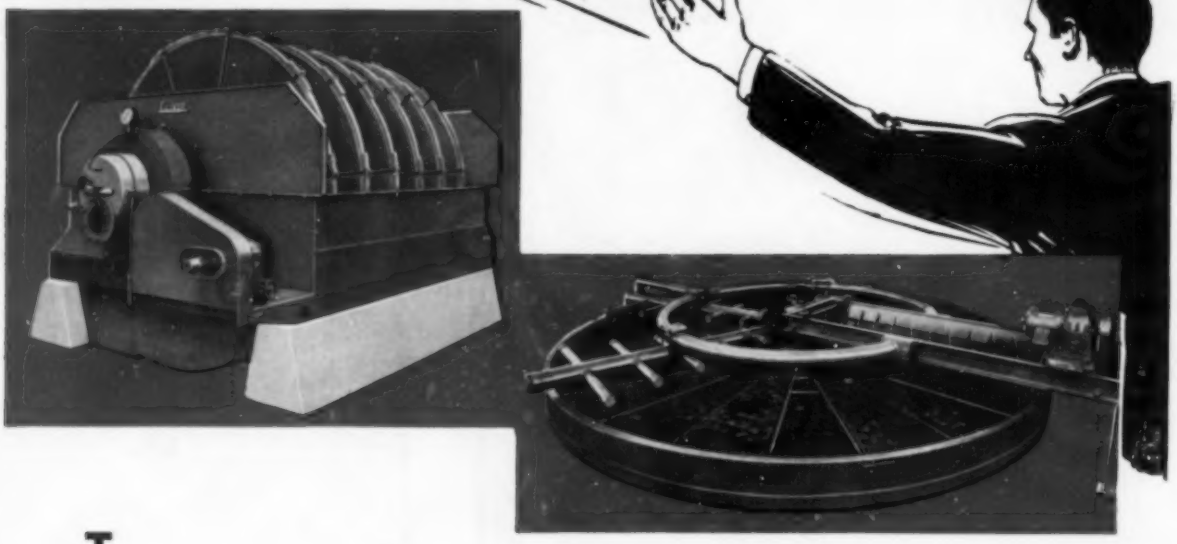
Full Contents on p 5

Cutting Supply Cost . . . p 70



COAL DEWATERERS...

that don't slam the fines around



This may be an idea for your coal operators who (1) must take the fines out of your washery discharge but (2) want those fines recovered with as little degradation as possible.

To accomplish objective No. 1 you will need an efficient dewaterer with plenty of hydraulic and sludge handling capacity and with efficient cake discharge.

To accomplish objective No. 2 you will need a dewaterer that handles the sludge gently . . . that doesn't slam the fines around.

You can accomplish both objectives by using either the Oliver Horizontal Filter (right) or the American Disc Type Filter (left) or both, depending upon the characteristics of the fines. They're both continuous vacuum dewaterers with exceptionally high capacity and solids retention values. Each shows less than 1% solids in the filtrate.

Our filtration engineers, who have had plenty of coal dewatering experience, will be glad to discuss your problem and work out the best fines dewatering system for your plant.

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

OLIVER UNITED FILTERS OUF INC.

NEW YORK 36 — 33 West 42nd Street • CHICAGO 1 — 221 North LaSalle Street
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RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

B. F. Goodrich Grommet belts lasted eight times longer

THAT continuous mining machine used to snap steel cable V belts in five days. The sudden and frequent jerks as the machine bit into the coal couldn't be absorbed. Then the mine operator tried B. F. Goodrich high-capacity Grommet V belts. Not only did they last eight to ten times longer, but they cost ⅓ less. A yearly savings of approximately $220.00, plus more earnings because of increased machine operating time.

Only with grommet construction is it possible to increase the number of cords reinforcing a V belt and still retain flexibility and resilience. Grommets are cord loops made like giant twisted cables except that they're endless. The B. F. Goodrich high-capacity V belt carries a 40% higher horsepower rating because it's built with larger grommets, having 40% more tensile strength. Increased strength in other belts must be accomplished by using more cord or fabric layers in the base rubber, thus reducing flexibility.

Comparison tests on identical drives show that other V belts stretch at least 65% more (sometimes even 165% more) than the B. F. Goodrich high-capacity. Actually, the Grommet is the only high-capacity belt that doesn't stretch enough to affect the efficiency of the drive. As a result, it practically eliminates the necessity of frequent and costly take-ups.

Your local B. F. Goodrich distributor has all the details and prices on other rubber products for the coal industry. Whether you need extra strong V belts, mildew resisting conveyor belts or air hose to stand rough service, your BFG distributor will show you how using B. F. Goodrich products will save you money. Call him. Or write *The B. F. Goodrich Company, Dept. M-294, Akron 18, Ohio.*

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION

JACK OF ALL TRADES

A "handyman" is fine for a multitude of small jobs that don't need specialized skill. But for the big job that must be done RIGHT, you pick a specialist, or the one special product for one special use. You pass up the "jack-of-all-trades" products that spread themselves thin over a wide variety of applications; and you concentrate on one that's made to do one special job and do it supremely well . . . such as Hulburt Quality Lubricants.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA, PA.

IS MASTER OF NONE!

and the same goes for LUBRICANTS

The "MASTER" of ONE Trade . . .

Hulburt

QUALITY LUBRICANTS

HULBURT is no "Jack-of-all-trades" in the field of lubrication. The care and operation of coal mining machinery is a tough job, with special problems of its own. But Hulburt Quality Lubricants are made and sold for use solely in this one field — and at this tough trade they are admittedly the "Master".

WANTED

an automatic, continuous operating machine for dewatering ⅛" x 0 coal. Must handle big volume — ton of coal a minute and 2 to 3 times the volume of water. Must get the coal down to 7 or 8% surface moisture when not more than 10% minus 200 mesh particles are present, and do it day in and day out with an insignificant amount of degradation. Must run for months at a time at cost of operation and maintenance not exceeding seven cents per ton.

Does this look like a tall order, based on your past experience with fine coal dewatering equipment? It won't to those who have Bird Coal Filters.

The Bird is the one and only machine that measures up to these stiff requirements. It offers the one best way to dewater your fine coal. Ask us to prove it.

BIRD MACHINE COMPANY

South Walpole • Massachusetts

Coal Age

SEPTEMBER • 1954

Idea Stimulation Pays!

GOOD IDEAS mean better operation, lower mining costs, everyone knows. But we all know, too, that imagination, initiative and generation of ideas really flourish in an atmosphere where progressive thinking is actively welcomed from all employees. That's one of the basic principles of effective management, and there are many coal companies today who realize that a definite program of idea stimulation often is the difference between profit and loss. One of these is the Peabody Coal Co., and for a look at how progressive management has proved itself in the planning and operation of the new 14,500-tpd No. 10 mine, see pp 80-96 of this issue.

The Peabody Suggestion System, one of the methods the company uses to encourage employee participation, will be described in detail in October *Coal Age*, including why it was inaugurated, how it works, and typical results. Peabody *is* one of the very few companies mining coal that have developed a successful employee suggestion system.

Also Ahead in Coal Age

Breaking Coal With Chemicals—What the new method is, how it is used and how it provides better roof control, greater safety and increased production at CW&F's Orient No. 1 mine.

The New Allen Mine—A full-scale report on service facilities at Colorado Fuel & Iron's Allen mine, a fully mechanized 6,000-tpd underground property recently opened after 5 yr of study and planning.

Modernizing an Anthracite Mine and Plant—A newer opening for better access to solid coal and a well-planned cleaning plant are two features of an up-dating program at the Raymond colliery of the Northwest Coal Co.

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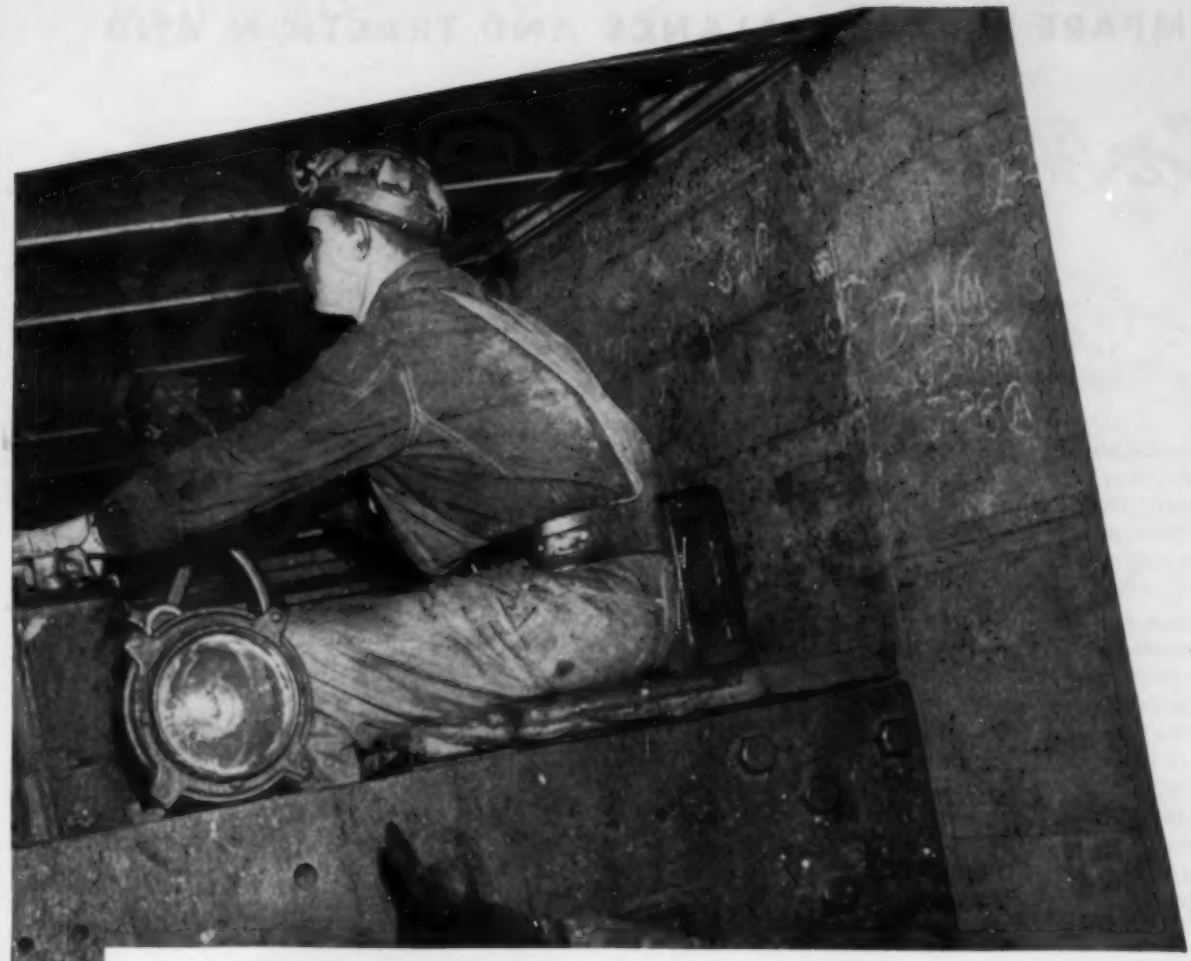


THE SURE WAY to get longer life for anti-friction bearings in locomotives, cutters, loaders and similar equipment is by effective lubrication. Use *Texaco Regal Starfak*. It not only adds years to bearing life but assures smooth, trouble-free performance along with worth-while maintenance savings.

Extra processing gives *Texaco Regal Starfak* extra resistance to oxidation, gum formation, separation and leakage. *Texaco Regal Starfak* effectively guards against wear and rust . . . *stays in* the bearings to assure fewer applications, less lubrication and maintenance expense. No seasonal change is required.

Another cost-saver to use is *Texaco Crater*. It keeps wire rope strong longer; on gears it reduces both noise and wear. If you prefer the convenience of liquid application, use *Texaco Crater X Fluid*—it *goes on* quickly and easily, *stays on* just like the regular *Texaco Crater*.

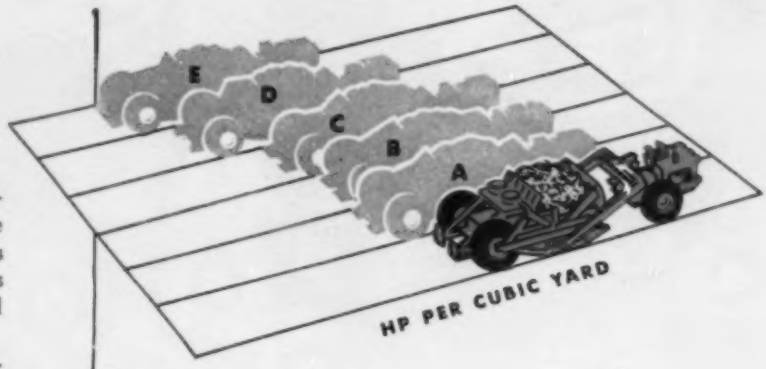
A Texaco Lubrication Engineer can help you raise efficiency and lower costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICANTS for the Coal Mining Industry

COMPARE POWER, BALANCE AND TRACTION AND

Why Allis-Chalmers Motor Scrapers



Examine the Allis-Chalmers TS-200 or TS-300 Motor Scraper point by point, feature by feature. Then let your Allis-Chalmers dealer demonstrate what these features mean to you in terms of bonus yardage and dependable performance.

See how fast Allis-Chalmers Motor Scrapers accelerate to "get the jump" on normal production from the moment they leave the pusher. See how safely they high-ball with a full load . . . how fast and steady they pull through the deep fill and return, up grade, to start a new cycle. Compare these Motor Scrapers on the basis of work done per dollar of investment. We think you'll agree an Allis-Chalmers Motor Scraper is your *number one* earth-moving value.

ACCELERATES FAST

The TS-200 develops 17.6 hp per cu yd struck capacity . . . the TS-300 develops 20—the highest ratios in their respective classes. With more power to move the payload, these machines get away from the pusher *fast* and maintain high average speeds throughout the entire cycle.

PERFORMANCE MAKES DOLLARS WHEN DESIGN

YOU'LL SEE

Out-produce

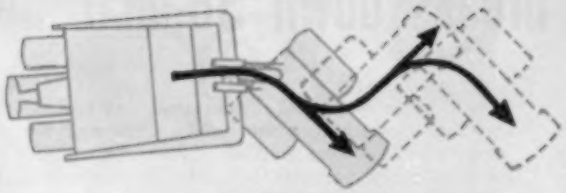
WEIGHT DISTRIBUTION LOADED

50 PERCENT 50 PERCENT

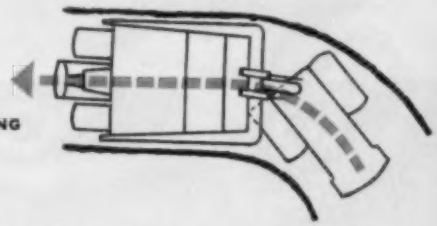
HIGHBALLS WITH THE PAYLOAD SAFELY

Loaded, the Allis-Chalmers Motor Scraper has equal weight on all four tires. This ideal weight distribution, together with low center of gravity, direct hydraulic steering which eliminates jackknifing, and big air brakes on all four wheels, allows the Allis-Chalmers Motor Scraper to take advantage of its high hp ratios by maintaining fast, yet safe haul speeds.

DUCK-WALKING



BACKING



MANEUVERS EASILY

There are no steering brakes to rob you of tractive power. Instead, direct hydraulic rams turn the tractor in the desired direction of travel. Steering is sure and positive—even going down extremely steep slopes in loose footing.

By swinging tractor left and right with the steering rams, the Allis-Chalmers Motor Scraper can duck-walk through heavy going where others bog down.

Backing up in close quarters is simple. Two-wheel tractor has complete control over scraper body . . . can even change directions without forward or backward movement.

WEIGHT DISTRIBUTION EMPTY

34 PERCENT 66 PERCENT

COMPLETES THE ROUND TRIP QUICKLY

The return trip from the fill is usually uphill. That's where two-wheel design pays off. When empty, 66 percent of the Motor Scraper's weight is carried on the traction wheels. There are no front wheels to rob drive wheels of tractive weight or to create rolling resistance in heavy going. This enables the Motor Scraper to make the round trip faster and usually in higher gear than other units.

MAKES SENSE

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

"'Monobel'® AA solves our 2 main problems—breaks down 38-inch 'middleman,' cleans bottom well"

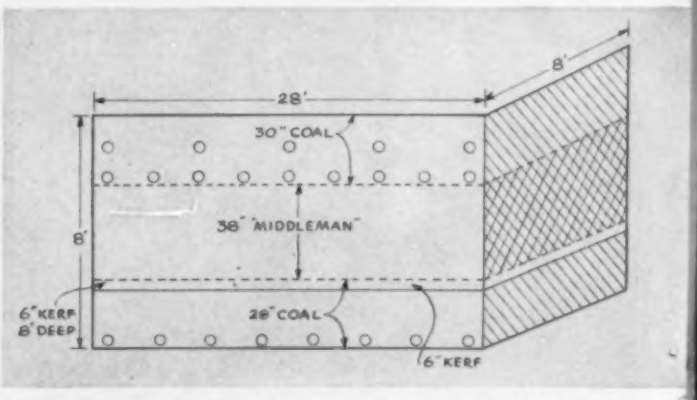
reports superintendent of a large Alabama coal mine

"Up to three years ago," he declared, "we had a double shooting problem on our hands. One was our 38" 'middleman,' a real trouble maker. The other: the job of breaking our coal loose from the bottom, as it is often burned tight to the floor. Naturally, we tried several permissibles, but none of 'em gave us *both* good breakage and bottom-cleaning action. Then we tried 'Monobel' AA. It's helped us solve both problems: breaks down the 'middleman' and cleans the bottom, assuring good loadability, high tonnage per man."

1. All holes charged, foreman makes final inspection just before shot. Here's the heavy 38" "middleman" that must be broken down and fractured so that loading machines can handle it without delay.

2. Typical fall of coal in mine shows how "Monobel" AA breaks down both coal and "middleman." And thanks to its slow spreading action, this permissible shears the back and ribs, and breaks the coal loose from the bottom.

3. Room completely cleaned up and ready for cutting. Note how "Monobel" AA has cleaned off the bottom and sheared the back right through the "middleman" to give a clean, straight face for the next fall.



4. Shooting pattern was developed in cooperation with Du Pont technical service men. Du Pont "Monobel" AA has sufficient water resistance to withstand the wet bottom-hole conditions found in this mine.

Whatever your big problem: "middleman" . . . coarse coal . . . or wet holes . . . Du Pont "Monobel" AA permissible dynamite can help you solve it. Mine owners and operators throughout the field use it . . . report its all-round efficiency has paid off. For complete information on "Monobel" AA, contact the Du Pont Explosives representative in your area. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

DU PONT

PERMISSIBLES

Blasting Supplies and Accessories

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

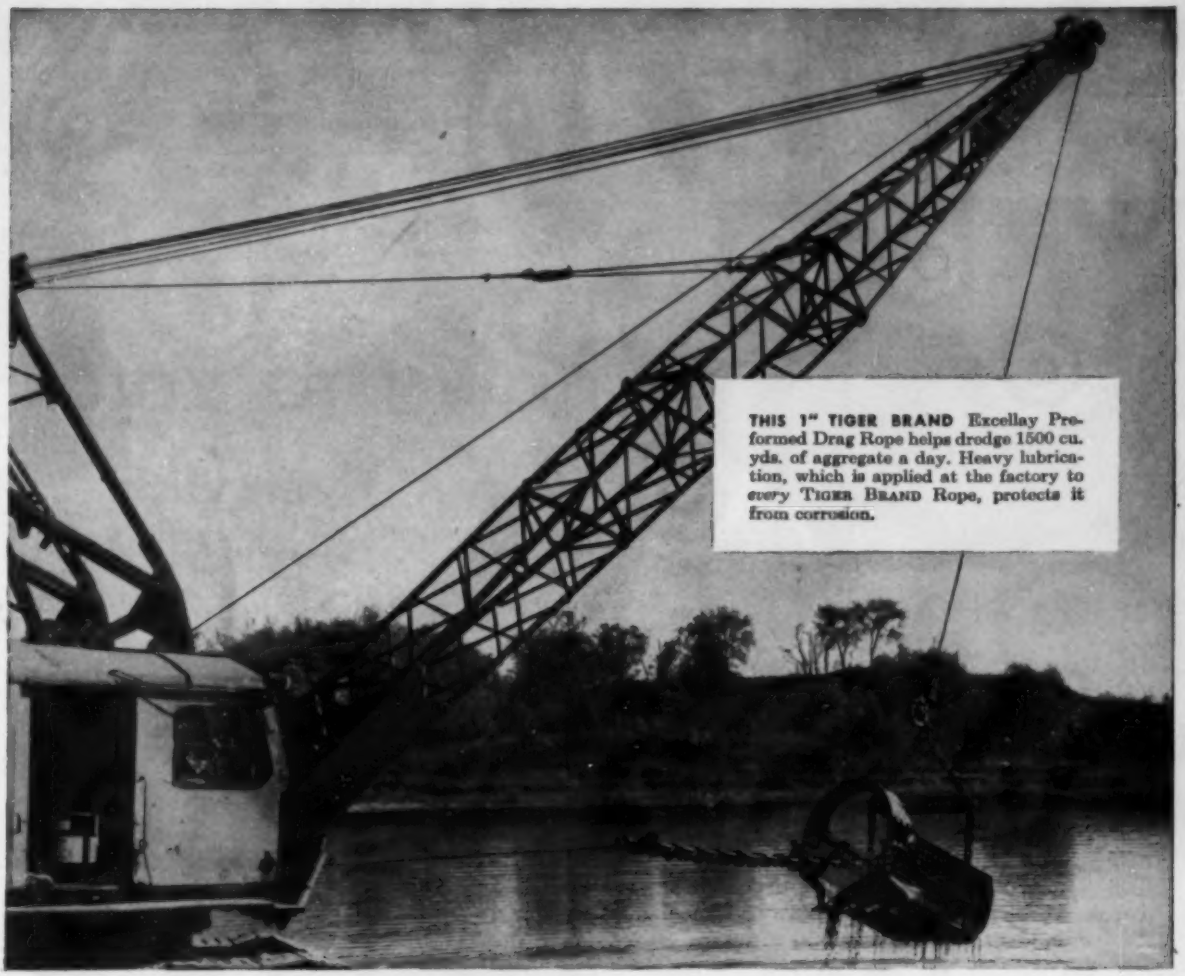
"Abrasion and corrosion *the worst*... Tiger Brand Wire Rope *the best!*"

says C. G. TUGEND, FREDERICKTOWN SAND & GRAVEL CO.

EVERY ROPE on all 5 excavating and materials handling machines at Fredericktown Sand & Gravel Co. is TIGER BRAND. This important stone processing company consults frequently with American Wire Rope Engineers and follows their recommendations to get the best possible service from each rope.

● If you want to know how good TIGER BRAND Rope is, just talk to C. G. Tugend, Secretary-Treasurer and General Manager of Fredericktown Sand & Gravel Co. in Fredericktown, Ohio. Here's what Mr. Tugend says about TIGER BRAND:

"We have some of the toughest operating conditions I've ever seen for wire rope. We're dredging in corrosive river water that is 7% sodium sulfate. On top of that, our drag ropes have to scrape through hard glacial rock



THIS 1" TIGER BRAND Excellay Preformed Drag Rope helps dredge 1500 cu. yds. of aggregate a day. Heavy lubrication, which is applied at the factory to *every* TIGER BRAND Rope, protects it from corrosion.

along the river. TIGER BRAND Rope works in these conditions constantly, yet has never shown any sign of rust and requires only a normal replacement. That's why we use it exclusively on all our equipment.

"We did try a different brand of rope *once* . . . on our 2½ cu. yd. Sauerman Hoist. But that will be the last time. The new competitive rope carried the same catalog specification as the TIGER BRAND Rope it replaced, yet the new one lasted less than ⅓ as long, contracted unevenly, and kinked so badly that it jammed the pulleys. We spent 6 days repairing that rope . . . lost 9,000 tons of production.

"Since that costly experiment, we've been using TIGER BRAND Rope *exclusively*. It has never shown a tendency to kink; and it is extremely pliable and strong. It has never given one bit of trouble."

For ropes that will give *you* high quality service, time after time, specify TIGER BRAND. Send the coupon for more information.

American Steel & Wire
Rockefeller Building
Cleveland 13, Ohio.

Please send me, without obligation, a copy of your helpful wire rope recommendation book, "The Right Rope for the Job."

Name.....

Company.....

Address.....

City.....State.....

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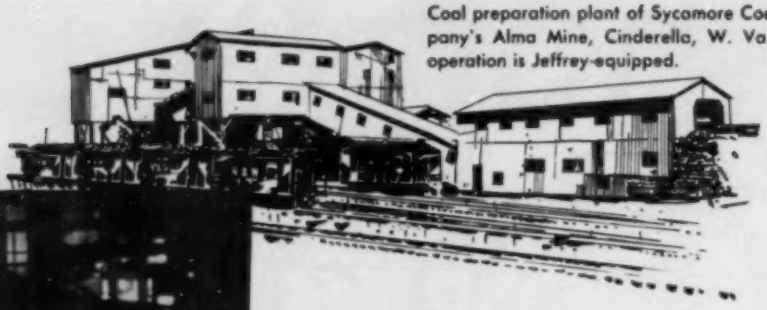
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

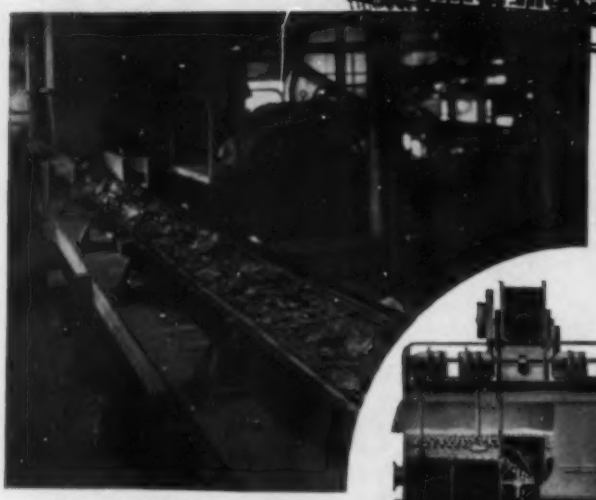
USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL



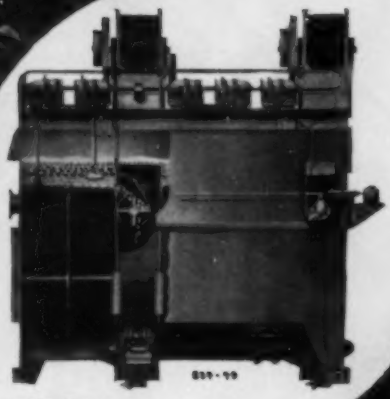
Coal preparation plant of Sycamore Coal Company's Alma Mine, Cinderella, W. Va. Entire operation is Jeffrey-equipped.



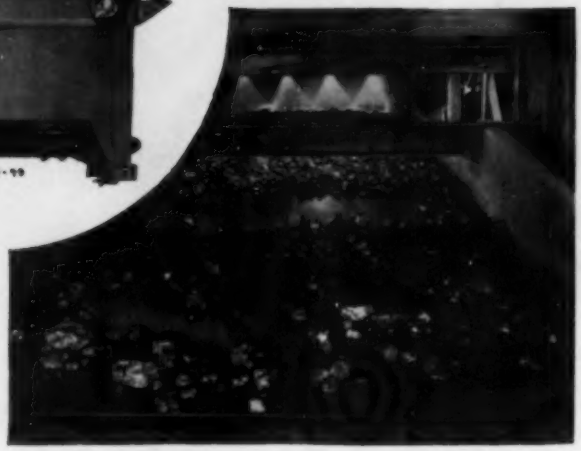
DOWN TO ZERO

even with over 50% rejects

Above: Jeffrey belt conveyor handles rejects from jig elevator to refuse bin at Sycamore.



Center: This two-compartment, five-cell Jeffrey Baum jig is the heart of Sycamore's coal preparation system.



Right: Clean Sycamore coal moves over sizing and de-watering screens to distribution belts and cars.

Jeffrey coal preparation equipment obtains maximum clean coal from all raw feeds — even when rejects run over 50%. All sizes of coal are cleaned to exceptionally low ash, including ¼ x 0.

Run-of-mine feeds are frequently reduced to a nominal top size in a Jeffrey heavy-duty double-roll crusher and flumed directly to the jig without pre-screening.

No Jeffrey jig has ever been retired from service due to "age". Some have served at three different sites. Others have exhausted several seams of coal. Most operate at, or in excess of, 99% efficiency.

Write for complete technical information.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED

. . .IT'S A JOB FOR JEFFREY!

"This Grease Stopped Overheating of Bearings!"

says Mr. Beeler, Sunlight Coal Company, Boonville, Ind.

When you've got a lot of money tied up in a piece of equipment—as does the Sunlight Coal Company, you can't afford idle time caused by burned out bearings.

Mr. Beeler writes, "Our Marion Dragline #7800 is protected by Sinclair Lubricants... from dolly rollers to hoist cables. Experience has proved to us that Sinclair HEAVY DUTY BEARING GREASES put an end to overheated bearings. Sinclair GEAR PROTECTIVE COMPOUND gives us all-weather performance—and Sinclair JET LUBE #20 maintains a better film on dolly rollers and track."

Mr. Beeler continues, "The important advantage to us is that Sinclair Lubricants provide optimum performance in heavy mining operations over the broadest range of temperature and weather conditions."

Let Sinclair Lubricants help you get all the life and *working hours* out of *your* equipment. Phone your local Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR LUBRICANTS

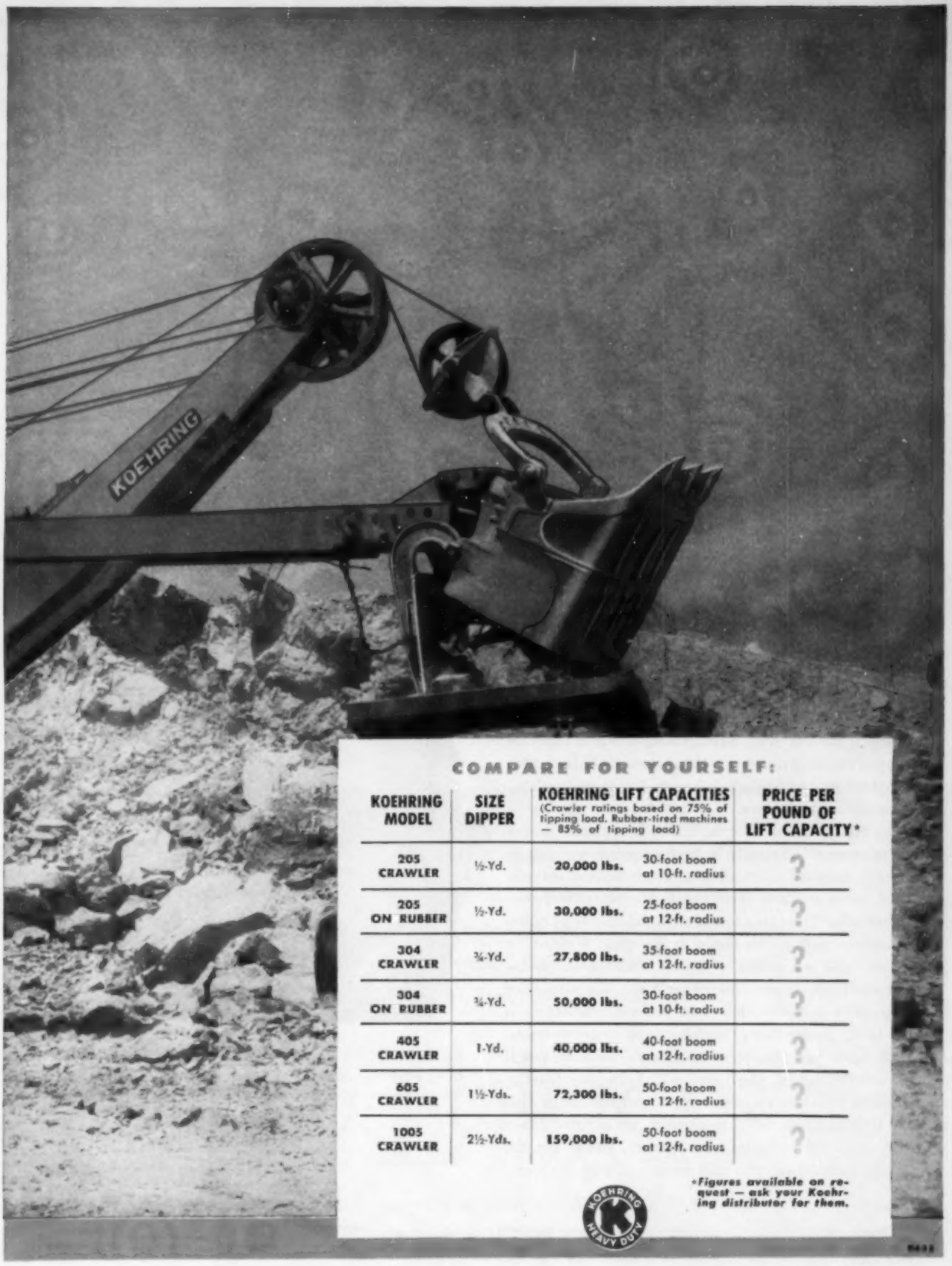
Measure excavators

by price per pound of lifting capacity

In analyzing shovel operation, you will find that price per pound of lifting capacity on crane rating is also an excellent measurement of excavator value. Remember, lift capacity is *work capacity*. Obviously, the machine with the heaviest lift rating not only picks up larger crane loads — it also has more strength, speed and stability to handle bigger loads faster with every excavator attachment.

Check Koehring lift ratings shown on the next page — then ask your Koehring distributor to give you the figures on price per pound of lifting capacity.

KOEHRING COMPANY Milwaukee 16, Wis. Subsidiaries: JOHNSON · PARSONS · KWIK-MIX

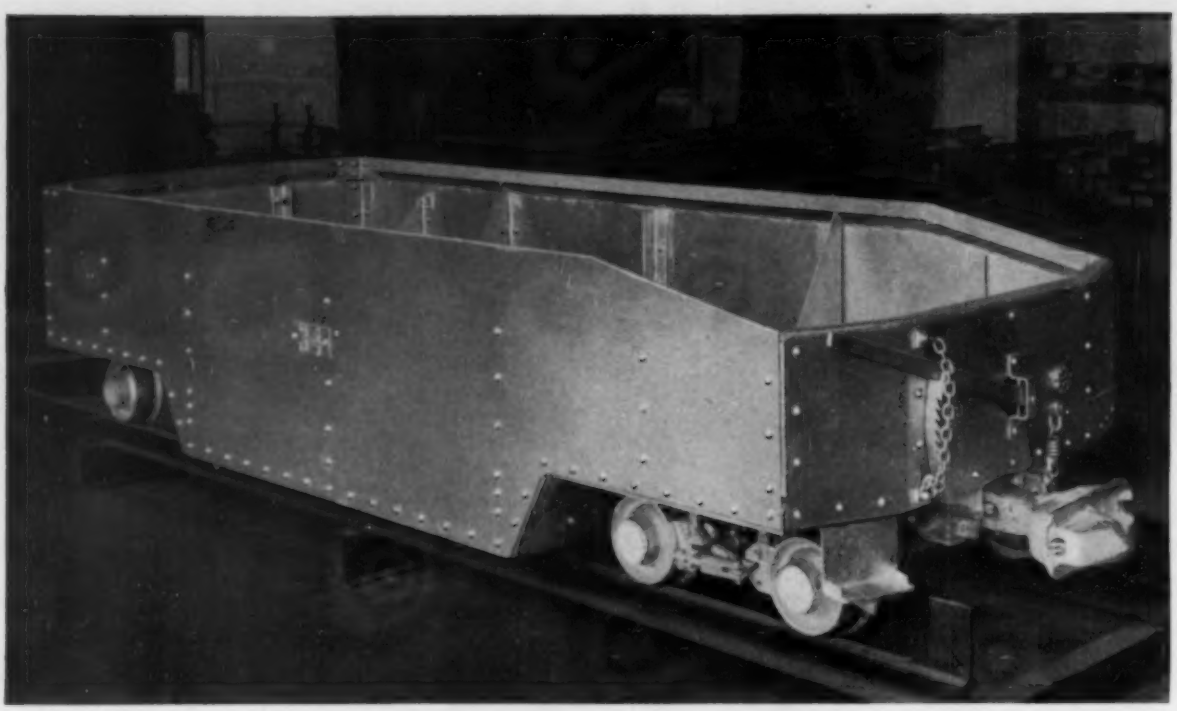


COMPARE FOR YOURSELF:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAPACITY*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

Figures available on request — ask your Koehring distributor for them.

KOEHRING HEAVY DUTY



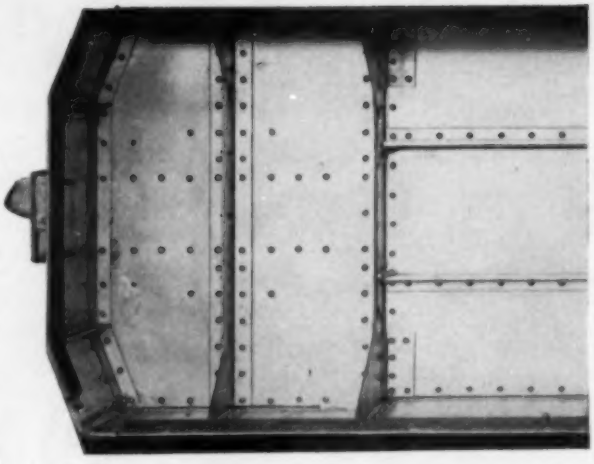
For those who prefer an All-Riveted Car

This husky Bethlehem car is one that has proved very popular where an all-riveted type is preferred. Designed for use with 42-in. track, it has a capacity of approximately nine tons. Equipment includes 12-in. forged wheels, self-equalizing brakes, cast-steel trucks, and automatic couplers.

The car is built to take especially heavy punishment and to operate efficiently in high-speed mine-haulage systems. Because of its all-steel construction, maintenance costs are low. And the first cost is low, too.

Naturally, if you lean to the all-welded style of body, Bethlehem will gladly build it for you. Welded or riveted—this is a matter of choice, and our shops are well equipped to produce either kind. We also offer a wide selection of models: four- and eight-wheelers in end-dump, rotary-dump, high-side and low-side types.

Whenever you plan to add new cars, we hope you'll call us. Bethlehem engineers will help you develop the design that meets your needs, and the shops will take it from there. Or if you prefer, we'll build direct from your own design. Either way, you'll get the car you want—a car that will serve you well for years.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

How to haul
BIGGER LOADS
at lower cost

INTERNATIONAL Western Model RDF-320. GVW rating, 70,000 lbs.

There's one sure way to cut the cost of hauling big off-highway loads, and that's with INTERNATIONAL Western Trucks.

INTERNATIONAL Western models are designed and built for big-capacity off-highway operation . . . with all components engineered to provide dependable day-in, day-out service.

What's more—INTERNATIONAL Western Trucks are tailored *exactly* to the requirements of each specific job. There are 4-wheel types and there are 6-wheel models . . . all available with a choice of engines, transmissions and other components for exact job specialization.

Many of the world's largest mines standardize on INTERNATIONAL Western Trucks. For owners' cost records show that INTERNATIONALS stand up best. And for 22 straight years, cost-conscious truck operators have made INTERNATIONAL the sales leader in the heavy-duty field.

Get full facts from your INTERNATIONAL Dealer or Branch. Time payments arranged.

America's Finest
Big-Capacity Off-Highway Trucks

Four specialized Western models. GVW ratings, 40,000 to 90,000 lbs. Thirteen engines from 175 to 356 hp. Choice of gasoline, LPG, or diesel fuel systems. Transmissions and axle ratios to fit any needs. Wheelbases from 145 to 301 inches.

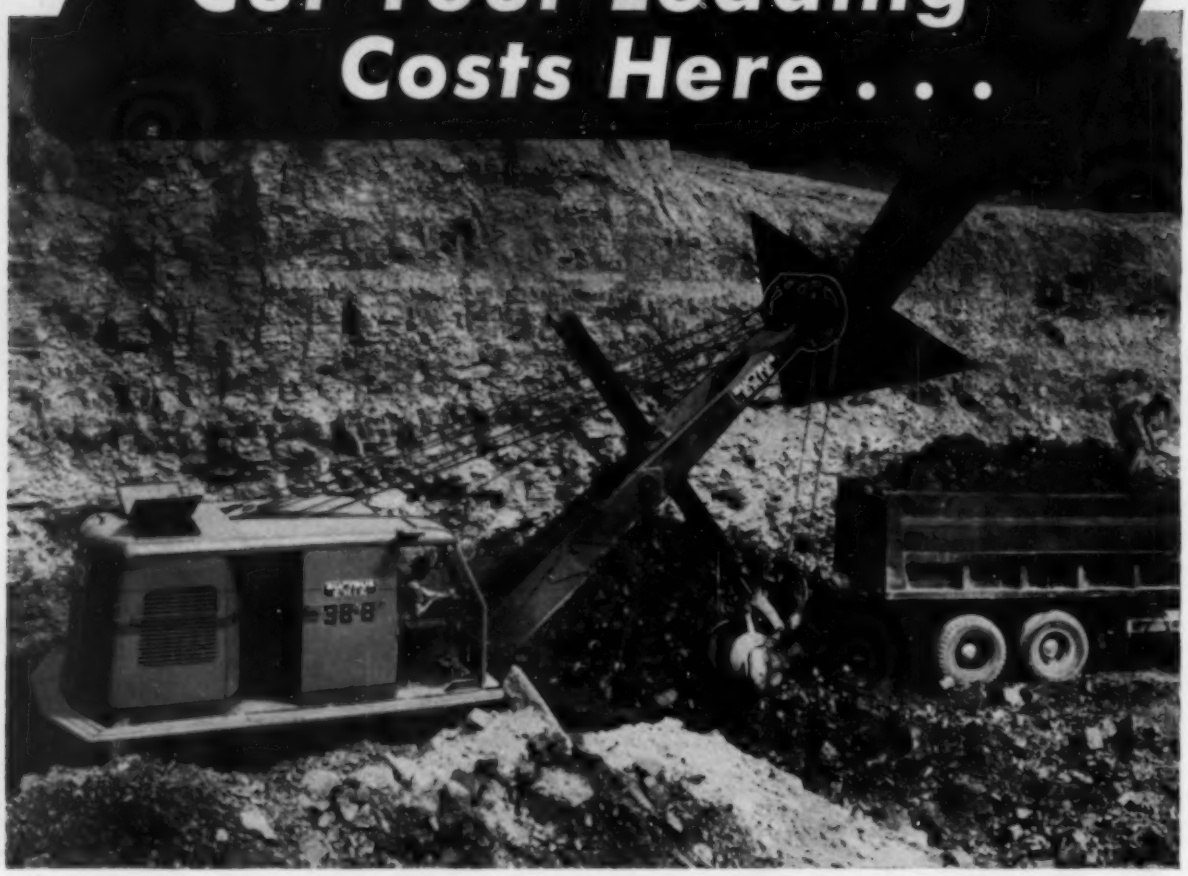
INTERNATIONAL HARVESTER COMPANY • CHICAGO

International Harvester Builds McCORMICK® Farm Equipment and FARMALL® Tractors . . . Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Better roads mean a better America

INTERNATIONAL® TRUCKS
"Standard of the Highway"

Cut Your Loading Costs Here . . .



Assign your coal loading duties to Bucyrus-Erie shovels and you make a real start toward the lower costs that mean bigger profits for you. That's because Bucyrus-Eries give you these important advantages of Individual Design:

YOU GET MORE TONNAGE because Bucyrus-Erie Individual Design for each model means perfect coordination of all machine functions. Powerful crowd action, rapid hoist and swing, big full dippers, and quick clean dumps all combine to move more overburden or coal each shift.

YOU HAVE LESS MAINTENANCE because Individual Design actually results in fewer wearing parts, and every part is right for the load it must carry.

YOU GET LONGER MACHINE LIFE because no parts are undersize or overstressed to "stretch" models. Adjustments hold longer and are easy to make. The working frame is a combination of great strength and light weight to provide a solid, rigid working foundation without excess material.

Let your local Bucyrus-Erie distributor explain further what Individual Design can mean in more efficient, more economical excavator operation.

24E54

BUCYRUS ERIE

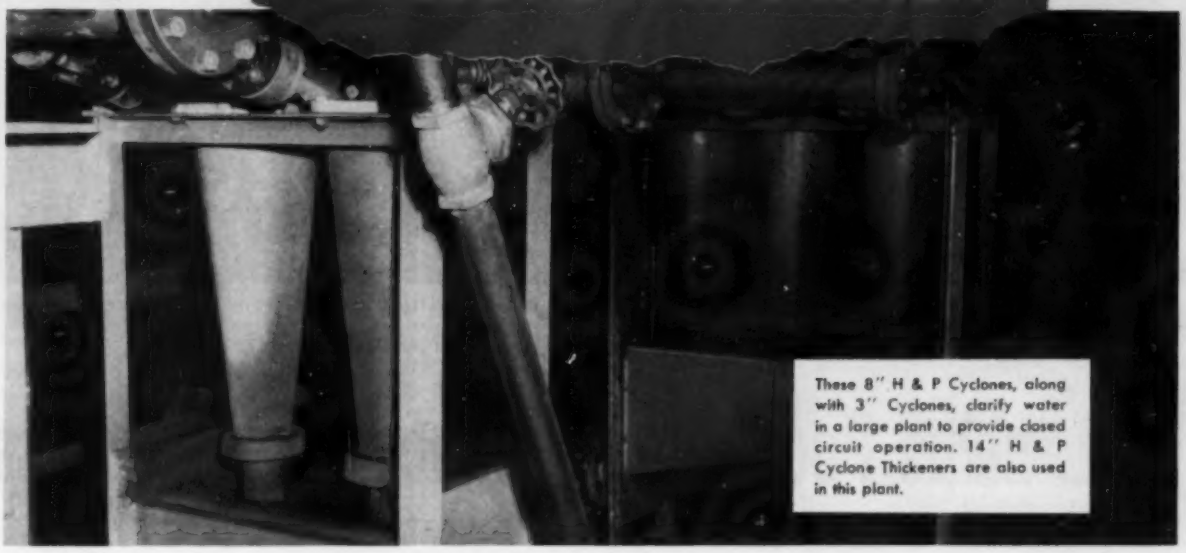
South Milwaukee, Wisconsin

Individual Design

. . . for every model in the line means that each is designed from the ground up to handle its rated load most efficiently. There is no over-dippering or over-powering simply to create another "new" model. All factors affecting efficiency such as speed, power and weight are properly balanced for most efficient overall performance.

The Answer to your Problem may be a

Heyl & Patterson CYCLONE THICKENER



These 8" H & P Cyclones, along with 3" Cyclones, clarify water in a large plant to provide closed circuit operation. 14" H & P Cyclone Thickeners are also used in this plant.

Every day in the mining industry Heyl & Patterson Cyclone Thickeners recover valuable material from wasted sludge . . . provide closed circuit operations . . . and deslime ahead of froth flotation to increase the froth product. H & P Cyclones are now working in all types of thickening, classifying and clarifying operations.

In many installations this versatile equipment has recovered and saved enough material to pay for itself in *one month's time.*

Heyl & Patterson Cyclone Thickeners can furnish you the same efficient, low-cost solution to your processing problems.

When a desliming, classifying or clarifying problem confronts you, call on the vast experience and the research facilities of Heyl & Patterson.

FOR MORE INFORMATION—WRITE FOR BOOKLET CT-31

Heyl & Patterson CYCLONE THICKENERS can help you obtain:

- **Recovery of Valuable Material from Wasted Slurry**
- **Closed Circuit Operation**
- **Sharper Classification**
- **Effective Desliming Before Froth Flotation.**
- **Thickening and Dewatering of Froth Product.**
- **Improved Filtration**
- **Low-cost Thickening, Classifying and Desliming**

Cyclone Thickeners
Thermal Dryers
(The Drying Dutchman
(Reinevold Centrifugal Dryer)
Thorsten Coal Sampling Systems
Rotary Mine Car Dumpers
Coal Crushers
Coal Preparation Plants
Bradford Breakers

Heyl & Patterson, Inc.
"SINCE 1887"
55 FORT PITT BLVD. PITTSBURGH 22, PA.

NERVE CENTER of coal plant operation is this G-E master control board. Operator can start, stop all units from this board, and has visual indication that all units are running, as well as levels of various bins and tanks. Starter buttons are arranged in order of starting sequence to permit ease of operation of the master control board.

G.E. helps Pocahontas reduce per ton costs

General Electric engineering services a key factor in Pocahontas's expansion plans to increase tonnage capacity, cut per ton costs

Pocahontas Fuel Company, Incorporated, has completed the second of two modern preparation plants designed to expand its tonnage capacity and reduce its per ton production costs. The first was at Itmann, W. Va., and the second is at Amonate, Va.—both utilized General Electric engineering services and equipment.

Working closely with Fairmont Machinery Company and West Virginia Electric Corporation, the contractors, G-E engineers helped in the design and installation of the electrical systems in the newly modernized heavy media section and the new fine section of the coal plant at Amonate. The plant is now producing more than 8000 tons a day in two eight-hour shifts.

The modernization and expansion at Amonate was handled on a project basis, from planning stage to completion. G.E. co-ordinated the selection, manufacture, and delivery of all required electrical components, to assure that the right equipment arrived at the right time.

First, a sales engineer focused the engineering resources of the General Electric organization on specific Pocahontas problems. G-E application engineers, assisted by product specialists, selected the right equipment to work together as an electrical system saving valuable time for Pocahontas engineers.

Pocahontas and Fairmont Machinery were kept regularly informed of production progress on electrical equipment. Care was taken to deliver components in the right order and at the right time so installation crews worked at top efficiency.

G-E field service engineers were available at Amonate to help supervise installations and check operation of the plant. They are available now, on short notice, for any further assistance needed.

EASY-TO-INSTALL G-E Cabinetrol* panel gives neat, centralized control at Amonate plant. Units were delivered assembled and wired to cut installation time.

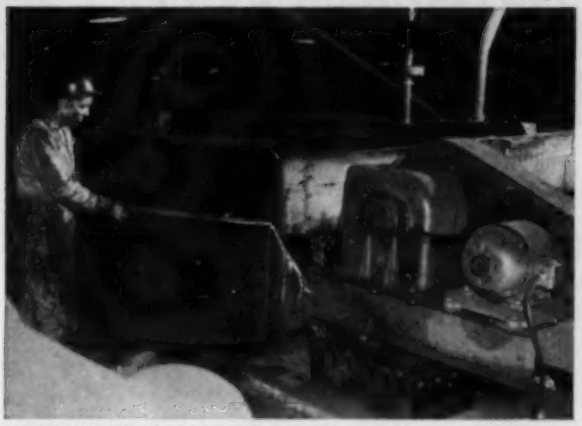
at Amonate plant

The modernization and expansion which the Pocahontas Fuel Company has undertaken is indicative of the industry's trend. The market calls for a higher quality product than ever before. The new Amonate plant, tall as an eight-story building, is operated by four men. Hundreds of tons of coal are cleaned each hour with push-button ease.

General Electric is ready to assist you in applying up-to-date electric equipment to help reduce your coal-processing costs. Whatever your problems, G-E system-engineered drives keep processing in step, minimize downtime, make most efficient use of manpower. For more information, contact your local G-E Apparatus Sales Office, or write for Bulletin GEA-5308, "Electrified Coal Preparation," to General Electric Co., Section 663-41, Schenectady 5, N. Y.

*Reg. Trademark of General Electric Co.

EASY-TO-MAINTAIN G-E Tri-Clad* 50-hp motor operates main fine coal conveyor. This totally enclosed fan-cooled motor delivers over 4500 tons of coal into section each day.



CONTINUOUS OPERATION of Deister table is assured by G-E 3-hp motor. The fine coal plant's 24 Deister tables are driven by G-E Tri-Clad motors.

SPECIALLY DESIGNED G-E 200-hp Tri-Clad motor accelerates high inertia drive of centrifugal filter. The totally enclosed fan-cooled motor drives filter with V-belts.

Engineered Electrical Systems for Coal Preparation Plants

GENERAL ELECTRIC

Tired of sloppy welds?

Switch to this Tigerweld BF-12 Rail Bond

THIS bond gives you a better weld than any other bond of the same type. That raised shoulder you see on the terminal forms a deep V-trough between the bond and rail. You can lay a lot more metal in that notch than you can put on ordinary bonds. As a result, you're sure of getting a weld that will hold.

The bond itself is just as strong as the weld. The terminal is made of a good husky piece of steel, and it's *butt-welded* to the strand for permanence.

This is a clamp-type bond, and that means fast, easy installation. Just rap the terminals on with a hammer. They stay in place while you make your welds.

Write for complete details, or get in touch with our nearest distributor.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS Tigerweld Rail Bonds

USS

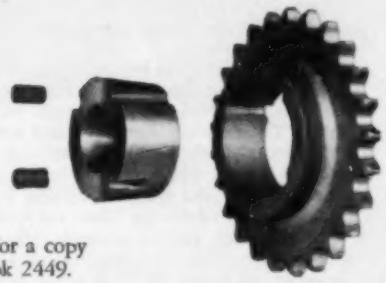
UNITED STATES STEEL

SAVE TIME! SAVE MONEY!

Use Link-Belt roller chain sprockets with taper lock bushings

Faster, less expensive procurement!

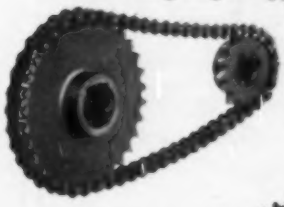
There's no delay for reboring when you need sprockets in a hurry. You can pick these *right off the shelf.* Stocks include sizes for single width chains from RC-40 through RC-160.



Send for a copy of Book 2449.

Faster, less expensive installation and removal!

No need to fit sprocket to shaft. Setscrews draw sprocket onto taper bushing, causing bushing to clamp tightly on shaft — equivalent to shrink fit. Turning setscrews in removal-holes quickly releases sprocket from shaft. Full bushing length supports sprocket on shaft.



AN IDEAL COMBINATION:
Link-Belt Precision Steel Roller Chain and Link-Belt Sprockets

LINK-BELT

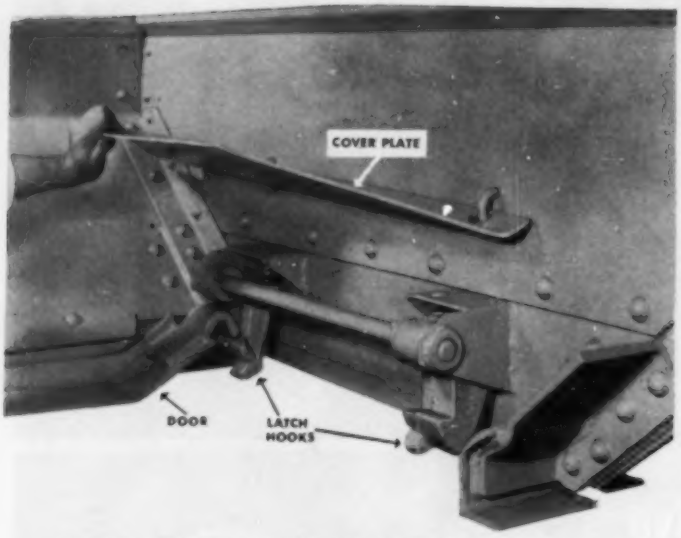
ROLLER CHAIN AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

15.807

The doors are locked twice and independently—

—with S-D "TWIN SAFETY LATCHES"



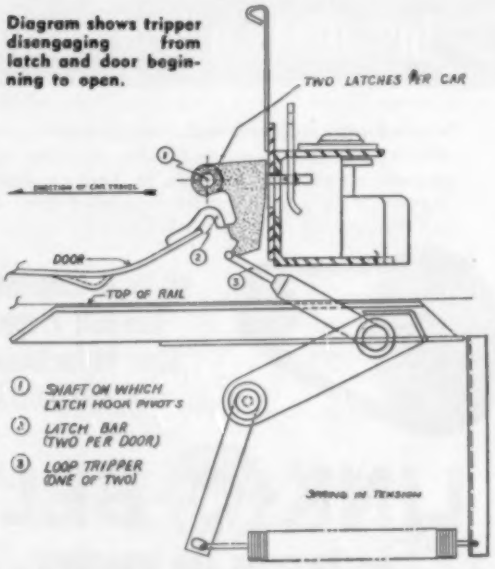
Mining men everywhere tell us that our Twin Safety Latches for drop bottom cars is an essential advantage. These latches are tripped independently by a pair of tripping devices mounted between the rails. Both latches must be tripped simultaneously before the doors open. This eliminates doors opening accidentally anywhere along the haulage route.

The detail drawing below illustrates how each independently operated tripping device mounted between rails engages the "Twin Safety Latches" and unlocks the doors. Each latch is completely protected from obstructions lying along roadway by the body structure. In this diagramatic drawing you see that no part of latch casting extends below the door or endsill. For this reason, a rock, timber or lump of coal lying between rails cannot accidentally trip either of the "Twin Safety Latches". This can only be done by the special tripping device mounted at the bin.

OTHER IMPORTANT FEATURES:

In addition to our important S-D Twin Safety Latch feature, other real advantages offered by S-D Automatics include: 1. You get a quarter to half-ton greater capacity for any overall dimension. 2. You get the only automatic dumping car completely sealed against dust leakage. This vital improvement gives you safer operation by preventing leakage of dust and enables you to eliminate the major portion of track clean-up costs. For complete information write or call us today. *Sanford-Day Iron Works, Inc., P. O. Box 1511 . . . Telephone 3-4191, Knoxville, Tenn.*

Diagram shows tripper disengaging from latch and door beginning to open.



While diagram above shows tripper disengaging from latch and door beginning to open, the photo at left above shows position of each hook when locked by one of the "Twin Safety Latches". This photo was made with deflector plate lifted and which, in normal use, completely covers latch operation.

Sanford-Day IRON WORKS

KNOXVILLE • TENNESSEE

BROWN-FAYRO DIVISION JOHNSTOWN, PA.

MINE CARS, All Types - PRECISION WHEELS - "Brownie" HOISTS CAR RETARDERS - SPOTTERS PUMPS - OIL SPRAY SYSTEMS

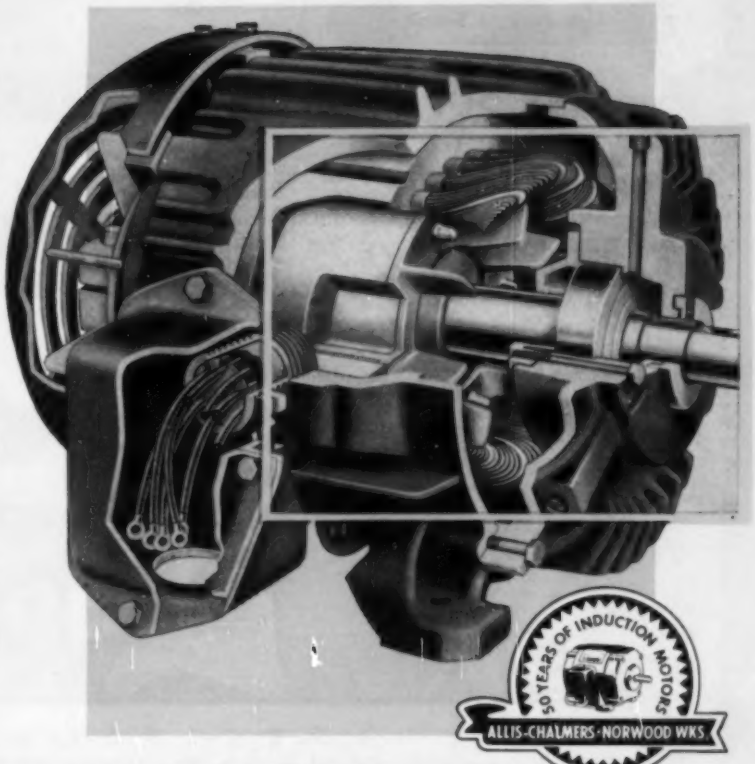
Here's motor superiority you can see

It takes 6 bolts not just 4 to give full bearing protection

THE TWO EXTRA BOLTS in the end housing of every Allis-Chalmers ball bearing motor are the proof of *extra* protection against bearing failure. These are the bolts that hold the bearing cap tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure . . . protects the grease and the bearing against contamination from dirt and moisture.

At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

Result? Allis-Chalmers motors pay off in longer, trouble-free bearing life, lower motor maintenance.



Get all the facts . . . judge for yourself — Compare Allis-Chalmers motors with other motors. Get the six-bolt construction that gives you complete bearing protection. For proof, see your Allis-Chalmers Office or Authorized Distributor, or write — Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-4441

Here's another

The union of the bit and the rod after drilling has a cohesive strength of several tons . . . A sharp blow of sufficient weight on the end of the bit skirt will serve to detach the bit from the rod.

SPECIFICATIONS

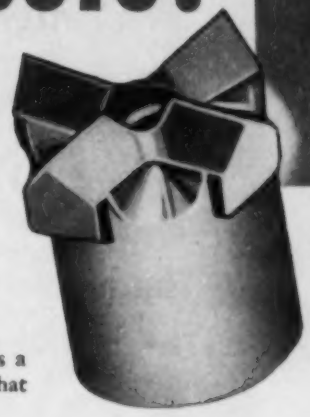
Mines everywhere cut drilling costs with CRD DETACHABLE DRILL BITS • 4 - Wing Type - Center Hole - Side Hole

Class "A" Bits For class "A" drill steel connection on any steel. Best suited to ⅞" steel.	1-1/4	Aluminum	**Class "B" Bits** For class "B" drill steel connection on any steel. Best suited to 1", 1⅛" and 1-¼" steel.	1-7/16	Orange
	1-5/16	Pink		1-1/2	Green
	1-3/8	Deep Green		1-9/16	Yellow
	1-7/16	Brown		1-5/8	White
	1-1/2	Grey		1-11/16	Black
	1-9/16	Maroon		1-3/4	Red
	1-5/8	Deep Blue		1-13/16	Blue
				1-7/8	Tan
				1-15/16	Plain
				2	Pink
				2-1/8	Maroon
				2-1/4	Aluminum

Cans are labeled showing size of steel socket, gauge of bit, and color.

way to cut drilling costs!

Use Le Roi-CLEVELAND one-use CRD Detachable Bits



Lower cost per foot of hole — that's the goal of everyone who has rock to drill. And that was the goal of Le Roi-CLEVELAND engineers, too. They didn't fool around with the problem either. Fifty years of experience in designing rock drills was put to work. The result — a one-use detachable bit that can save you money in a wide variety of applications.

This designing job wasn't done overnight. You can't produce the results our engineers were after in such a short time. Instead, these bits were put to work—and, for a number of years they have helped reduce drilling costs materially in mines, in quarries, and on construction jobs.

That's why we offer them to you now — with complete confidence in their ability to help you improve your rock-drilling cost picture.

These Features Mean Lower Drilling Costs for You

Faster Drilling Speed — Special offset gauge feature, which permits the use of thinner wings and a steeper reaming angle, greatly reduces binding and provides ample clearance for cuttings. Result is a free, fast-cutting chiseling action that gives you greater drilling speed.

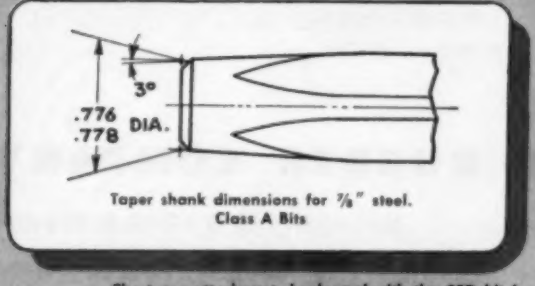
Less Drill-Steel Breakage — The method of attachment used with the CRD bit eliminates threads on the drill rod. Since a drill rod is only as strong as the root diameters of its threads, the tapered threadless CRD design provides longer drill-steel life — reduces drill-steel handling and reconditioning costs.

Lower Rock Drill Repair Costs — Because the CRD bit design reduces binding in the hole, there is less strain on the rotation parts of your rock drills. Rifle bars, rifle nuts, and chucks last longer. You get more drilling done at lower cost.

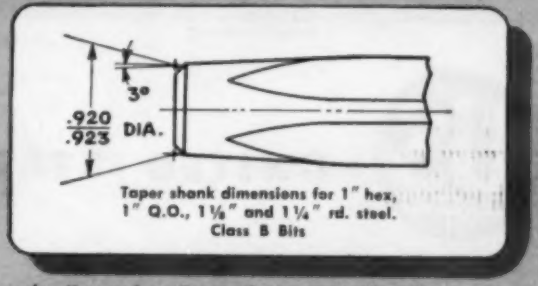
Since no special equipment is needed to thread rods, you owe it to yourself to try a can of CRD bits. They're ideal for roof bolting and for use in your stopes as well as in your headings. A short trial will give you first hand information on the ability of these bits to cut drilling costs in your property as they have in so many others.

Bulletin RD-29 gives detailed information. A copy is yours for the asking — just write for it. RD-58

CLEVELAND ROCK DRILL DIVISION
Le Roi Company
A Subsidiary of Westinghouse Air Brake Co.
12500 BEREA ROAD • CLEVELAND 11, OHIO
Plants: Milwaukee, Wis. • Cleveland — Greenwich — Dunkirk, Ohio • Coldwater, Mich



Taper shank dimensions for ⅞" steel.
Class A Bits



Taper shank dimensions for 1" hex, 1" Q.O., 1⅛" and 1¼" rd. steel.
Class B Bits

The taper attachment shank used with the CRD bit is easy to make. You need no dies or other expensive threading equipment. Several simple, low-cost methods can be used for preparation — grinding, forging or machining.

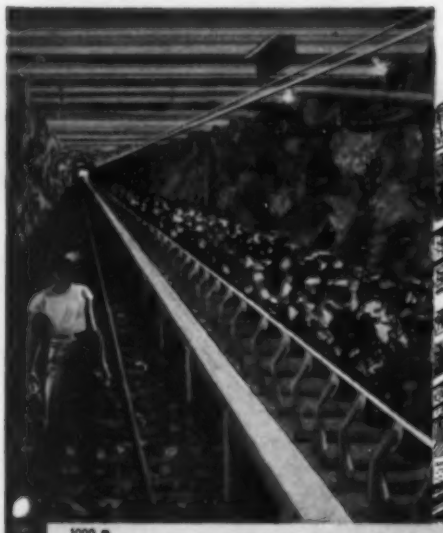
BREAKING THROUGH TO NEW HIGHS WITH THE NEW U. S. SUPER USTEX-

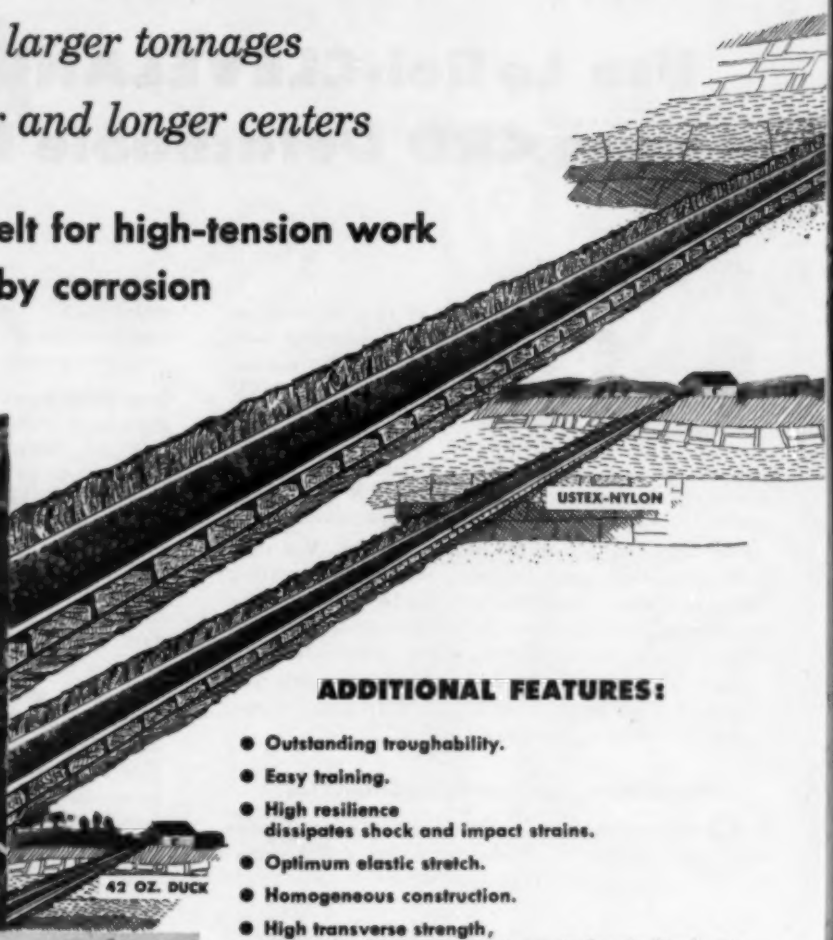
for higher and higher lifts

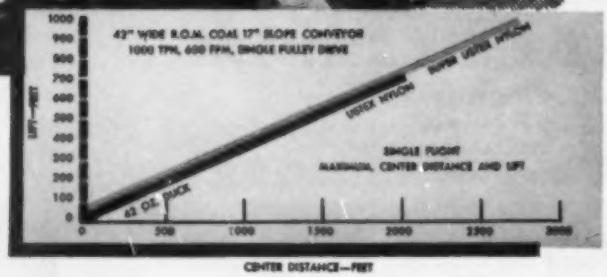
larger and larger tonnages

longer and longer centers

The high-strength belt for high-tension work
— — not affected by corrosion







ADDITIONAL FEATURES:

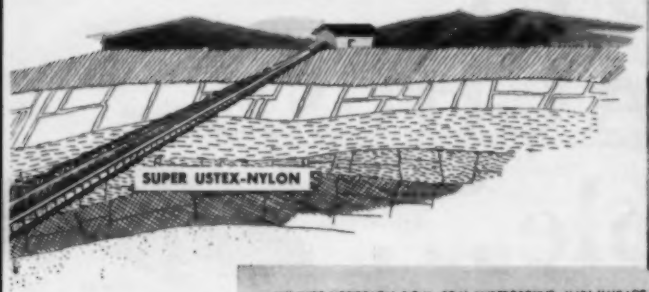
- Outstanding troughability.
- Easy training.
- High resilience dissipates shock and impact strains.
- Optimum elastic stretch.
- Homogeneous construction.
- High transverse strength, proper load support, resistance to longitudinal cuts and tears, resistance to flexing fatigue.
- Low permanent stretch.
- High safety factor.
- Easy to splice— no special skills, techniques or materials required.
- Belt tension distributed evenly through entire carcass.
- A patented construction exclusive with United States Rubber Company.
- Mildew-inhibited.

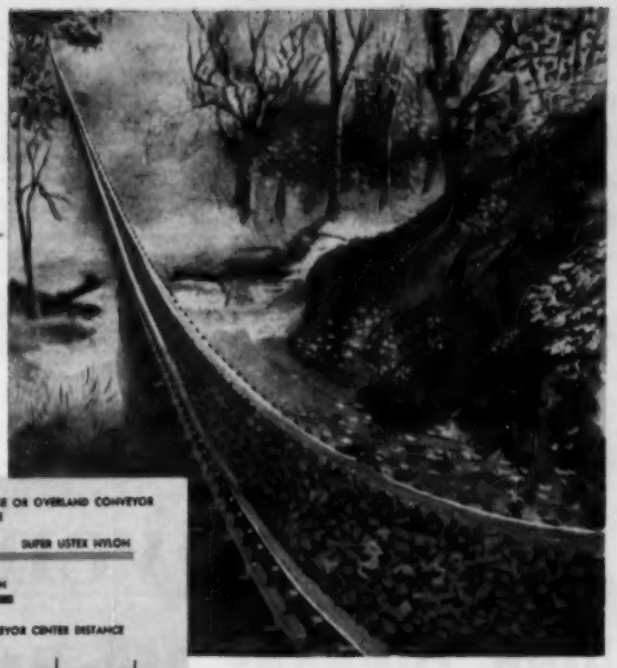
US RUBBER

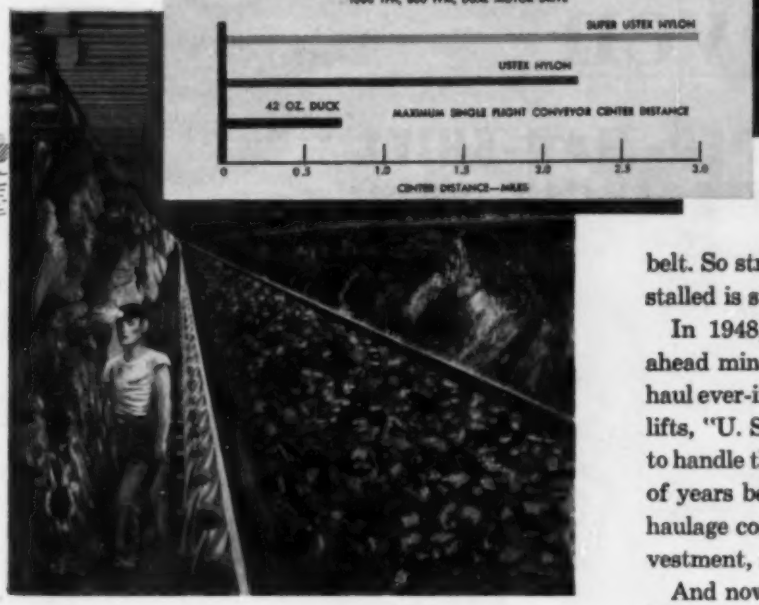
UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION

NYLON BELT!







This great new Super Ustex-Nylon Belt is the latest in United States Rubber Company's parade of Belt Champions.

In 1929, "U. S." gave coal haulage a history-making lift—by presenting the 42-oz. duck belt, later to become standard in the industry.

In 1939, "U. S." came out with the strongest belt ever made up to that time—the famous 48-oz. duck belt. So strong was this belt that the first one installed is still in active service.

In 1948, still anticipating that in the years ahead mine operators would find it necessary to haul ever-increasing tonnage up higher and higher lifts, "U. S." introduced the Ustex-Nylon Belt—to handle the great tensions that were undreamed-of years before. In one mine alone, this belt cut haulage cost 50 cents per ton with 25% lower investment, and saved 6,000 feet of coal travel.

And now, in 1954, comes the latest champion, the Super Ustex-Nylon Belt, far stronger than even its illustrious predecessor. This great belt will carry record-breaking tonnages saving the coal industry additional thousands of dollars.

There is always a "U. S." sales engineer ready to work out haulage problems for you through Three-Way Engineering—the "U. S." method of working with mine engineers and the designers of conveyor equipment. Consult any of the 26 "U. S." District Sales Offices, or write to address below.

"U. S." Research perfects it ... "U. S." Production builds it ... U. S. Industry depends on it ...

ROCKEFELLER CENTER, NEW YORK 20, N. Y.

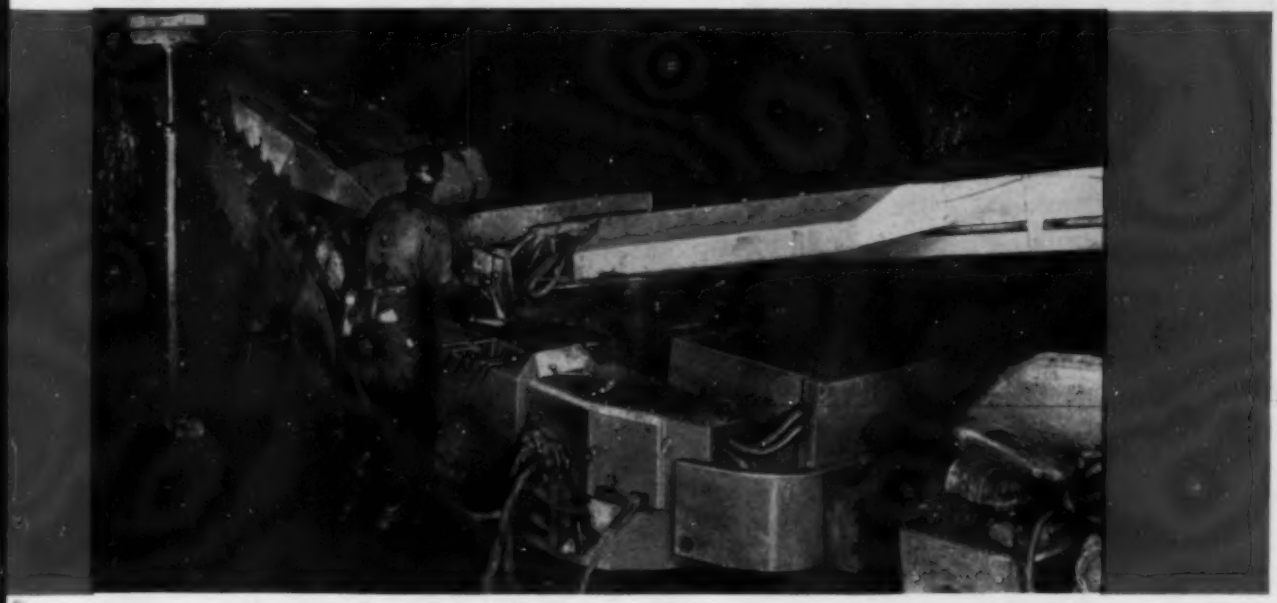
If you want a reliable continuous-type mining machine that gives high tonnage per man month-in month-out . . . that stays in operation at the face a peak percentage of time . . . that holds maintenance to rock-bottom level . . . that is fast and flexible . . . that has been thoroughly field proven — then here is the answer: the patented Jeffrey 34-F.

The crawler-mounted 34-F is totally unlike any other continuous-type mining machine now on the market. Twin cutter bars undercut the coal seam; two shear bars shear the ribs, and two vibrating hammers with a 15-ton wallop hit the coal 1800 times a minute to vibrate it loose. The undercutting chains carry all the coal into the discharge conveyor, leaving a clean bottom for shuttle cars and other equipment. The 34-F does all this work — yet it is only 6½ ft. wide and 30 ft. long, including the conveyor.

The 34-F is fast and flexible for every application from development work to pillar extraction. It trams at 104 ft. per minute — high speed for safer pillar recovery. Shear bars operate independently of each other. Undercutting bars are adjustable from 7½ inches below the pavement to 27½ inches above to follow bottom rolls and provide clearance for tramming. Conveyor swings 60 degrees either side of center and elevates to load shuttle cars properly. Hammers raise and lower, swing right and left, advance 34 inches or retract completely for effective positioning any place between the shear bars from roof to top of undercut. The 34-F's flexible movements, as illustrated on the opposite page, are unequaled in any other continuous-type mining machine.

These 34-F machines are now delivering a substantial share of the production in the mines of a big steel company. Lengthy production surveys in a mine using 34-F's exclusively show that with a crew of three or four, each 34-F mined — day after day — an average of over 165 tons per shift. This was more than 40 tons for each man at the face and about 16 tons for each man on the entire payroll. The machines operated 60% of the total face time!

Four types of 34-F's are offered, for coal 56" to 108" in height. Shear bars and undercutting bars have water spraying system. The automatic Trabon grease system, which lubricates 40 points simultaneously, is standard equipment.



Jeffrey district office salesmen have complete information on the 34-F. Call or write your nearest Jeffrey office. Find out how reliable continuous mining can be with the Jeffrey 34-F Mining Machine.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED . . . IT'S A JOB FOR JEFFREY!

"Me Switch? ...Never!"

"OK! SO I AM PIG-HEADED! I gave up trying other ropes years ago. It pays me to standardize on Roebling. Why? Well, with Roebling I get exactly the type of rope I need, when and where I need it . . . no makeshifts . . . no delays . . . and the performance is tops."

* * *

Why not find out for yourself? Call your nearest Roebling office or distributor for a Field Man. He'll recommend the ropes that perform and stand up best in the mines. And you'll learn what service really means!

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J.

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 81 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6316 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

UP-GRADE—COMPETE

Get your share of the Fuel Values Now Lost in your Fine Coal Slurries

McNally fine coal unit is in service in the plant of the Pittsburg and Midway Coal Preparation Plant, Hallowell, Kansas.

McNALLY RHEO
FINE COAL PACKAGE PLANT

See Next Page for Fine Coal Drying —→

Here is another McNally plant that solves your problem for producing premium fine coal, even from poor or indifferent raw coal.

The McNally Rheo Washer's initial low cost, its ability to retrieve maximum fuel values, and its low operating cost give you a distinct and profitable competitive advantage.

Here are the important features of the McNally Rheo Washer:

1. Readily Adaptable to Existing Facilities.
2. Uniform Product.
3. Low Initial Cost.

It will pay you to INVESTIGATE, NOW

Mail this card!

FIRST CLASS
PERMIT No. 93
(Sec. 34.9, P. L. & R.)
PITTSBURG, KANSAS

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

4c-POSTAGE WILL BE PAID BY—
McNally Pittsburg Mfg. Corp.
PITTSBURG, KANSAS

FOR INITIAL ECONOMY

and Profitable High Evaporative Capacity!

Up-grade your fine coals with safety — deliver maximum BTU to your customers, winter and summer. The McNally Cascade Fine Coal Dryer solves the difficult problem of handling fine coal (⅛" to 0) with speed and efficiency.

The complete installation of the Cascade Fine Coal Dryer is shown at the left. It incorporates the furnace, dust collectors, and exhaust fan. An enlargement of the drying unit proper is shown above. Hot gases (red arrows) are induced through the cascading fine coal bed, and exhaust gases (blue arrows) are swept up through the cyclone collectors. Extremely fine dust is retrieved by dust collectors and returned to the coarser particles.

This complete package is designed for use with your present washer, and elements may be modified to take advantage of existing furnace, dust collecting, and exhaust facilities.

McNally's years of experience assure complete satisfaction—low cost per ton.

LEADING MINES
use
McNALLY DRYERS

STATE YOUR PROBLEM HERE OR ON YOUR LETTERHEAD

I am interested in

☐ Washing_____" x 0 at_____tons per hour.

☐ Drying _____" x 0 at_____tons per hour.

Name_____ Title_____

Company_____

City and State_____

( ) Have Sales Engineer call for further consultation.

( ) Send additional information.

McNALLY PITTSBURG
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

The Men who Know Coal from the Ground up

McNally Pittsburg Manufacturing Corporation—Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
Engineering and Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

WESTMORELAND COAL HAS FOUR G-E 25-TON DIESEL-ELECTRICS AT ITS HAMPTON MINES. ONE LOCOMOTIVE HAULS AS MANY AS SIX LOADED CARS PER TRIP.

6 reasons why . . .

You can get more productive surface haulage with a G-E diesel-electric locomotive

1. FULL UTILIZATION OF POWER—electric transmission delivers full power for all normal speed and tractive effort requirements.

2. HIGH AVAILABILITY—in normal service, you can expect a G-E diesel-electric to be on the job 24 hours a day, seven days a week, with only about eight hours out for maintenance. It carries sufficient fuel for several days. Refueling and oiling can be carried out during shift changes.

3. FAST, FLEXIBLE POWER—helps speed up your haulage. Response to the throttle is instantaneous. Acceleration is quick and smooth. Reversing is a simple operation.

4. SIMPLIFIED MAINTENANCE—there's no fire-cleaning, ash-handling, watering, or watching, because a G-E diesel-electric does not have boiler or fire-box. Neither does it have mechanical transmission with its inherently high maintenance.

5. EASIER ON THE TRACKS—smooth traction, short wheelbase, low weight per axle, add up to less wear on your tracks. A G-E diesel-electric has no dynamic augment or heavy reciprocating parts to place undue strain on the tracks.

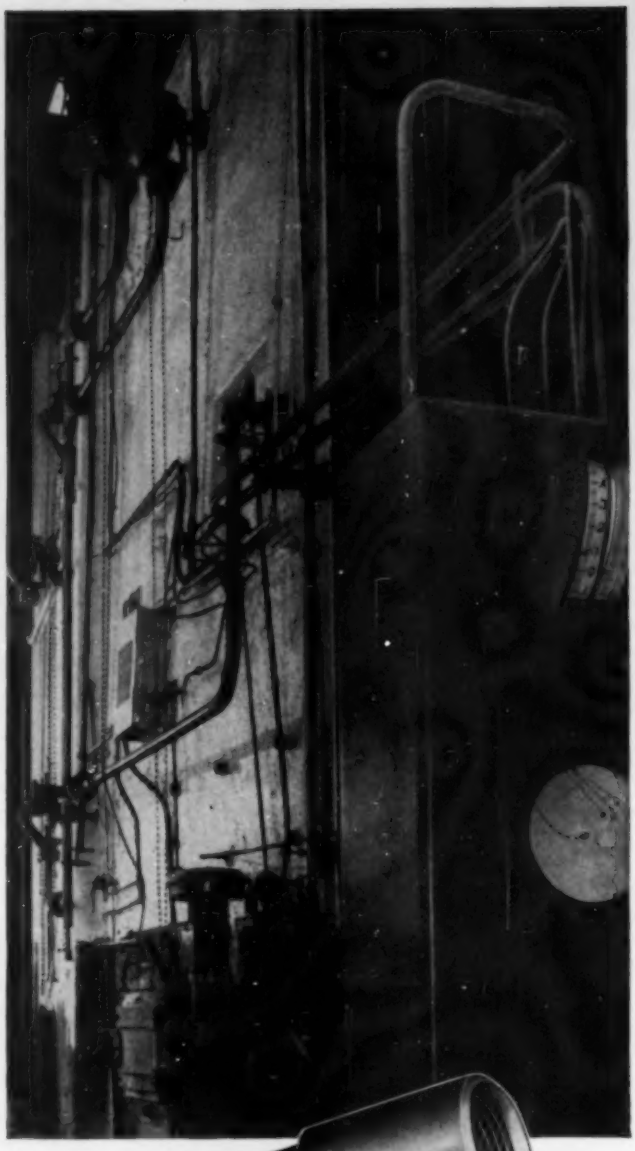
6. HAZARDS REDUCED—the G-E diesel-electric does not emit smoke or harmful gases. It is ideal for use in mining operations.

G.E. makes diesel-electric locomotives in seven standard sizes: 25, 35, 45, 50, 65, 80, and 95 tons. Ask your G-E Apparatus Sales representative for more details about them. Or, write to: General Electric Co., Section 120-70, Schenectady 5, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

This YOLOY pipe has lasted 6 times longer

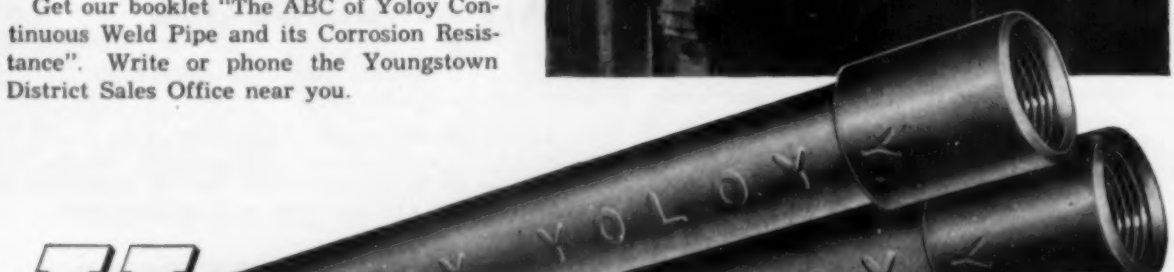


The pipe shown in the photograph of this large boiler carries steam for the "soot" and "fly ash" blower system in an Ohio electric plant. The service is so severe that regular carbon steel pipe had to be replaced as often as 60 days.

A solution for this corrosion problem was obtained by installing Yoloy pipe. Now, twelve months later, the Yoloy pipe is still in service—hasn't developed a single leak. It has lasted six times longer, and looks good for many months more.

Yoloy Continuous Weld Pipe is made from the same nickel-copper steel composition that has proved so successful in the oil, mining, railroad, chemical, trucking and other industries where resistance to corrosion and abrasion is of prime importance. It is now available in pipe sizes, from ½" to 4".

Get our booklet "The ABC of Yoloy Continuous Weld Pipe and its Corrosion Resistance". Write or phone the Youngstown District Sales Office near you.



Youngstown

QUALITY YOUNGSTOWN SERVICE

YOLOY PIPE

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

No. D3A500RM Male
& No. D3A500RF Female
Plugs Illustrated

for peak production
SECTIONALIZED CABLE WITH JOY (SPB) PLUGS

BULLETIN
No. B39a

Modern mining schedules allow little time for cable repair or replacement. That's the reason why more and more portable power feeders are being *sectionalized* with JOY SPB (Straight Pin Bigun) Connectors. Cable so sectionalized can be quickly lengthened or shortened through addition or deletion of sections . . . and damaged sections can be easily replaced. This cuts "down-time" to a minimum and increases production.

JOY Straight Pin Bigun Connectors are built for rough mining service. Equipped with threaded couplings and the famous JOY two-way water seal, they can't be surpassed for performance, safety and durability . . . and because they're molded to cable as one-piece neoprene units, they're shatter-proof, wear-resistant and highly impervious to the deteriorating effects of moisture, grease or oil.

JOY SPB plugs are available for A.C. or D.C. operation in a wide variety of conductor combinations and current capacities. • For more detailed information, ask for your copy of Bulletin B39 A. You'll be glad you did! ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.,*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

W&D M 4830

JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

There's just one reason for building equipment with USS High Strength Steels...

...to cut operating

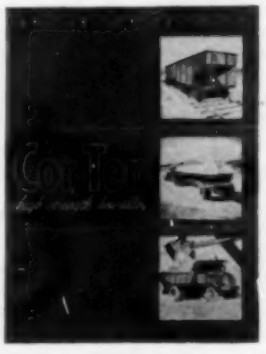
• 'Dozers, shovels, trucks, and draglines made with USS High Strength Steels have *extra* stamina to keep them working longer and harder. Moving more tonnage. Cutting repair and replacement costs. That's how these strong, tough steels, like USS TRI-TEN, USS COR-TEN, and USS MAN-TEN, help you pack in more profit.

These famous "steels that do more" have a 50% higher yield point than ordinary carbon steel. They provide greater resistance to fatigue, wear, abrasion and impact. As a result, when you replace ordinary steel with USS High Strength Steels of the same thickness, your equipment will have greater strength, longer life, *yet* will weigh no more. On the other hand, by using these steels in appropriate thinner sections you can: (1) reduce equipment weight without reducing its strength; or (2) increase the size and capacity of equipment without increasing its total weight or the power needed to move it.

If your equipment must operate at sub-zero temperatures, or in corrosive atmospheres, one or another of the USS High Strength Steels will give it resistance to these destructive forces. Any way you figure it, USS High Strength Steels, used singly or in combination, will make your equipment more productive—keep it *in* service and *out* of the repair shop.

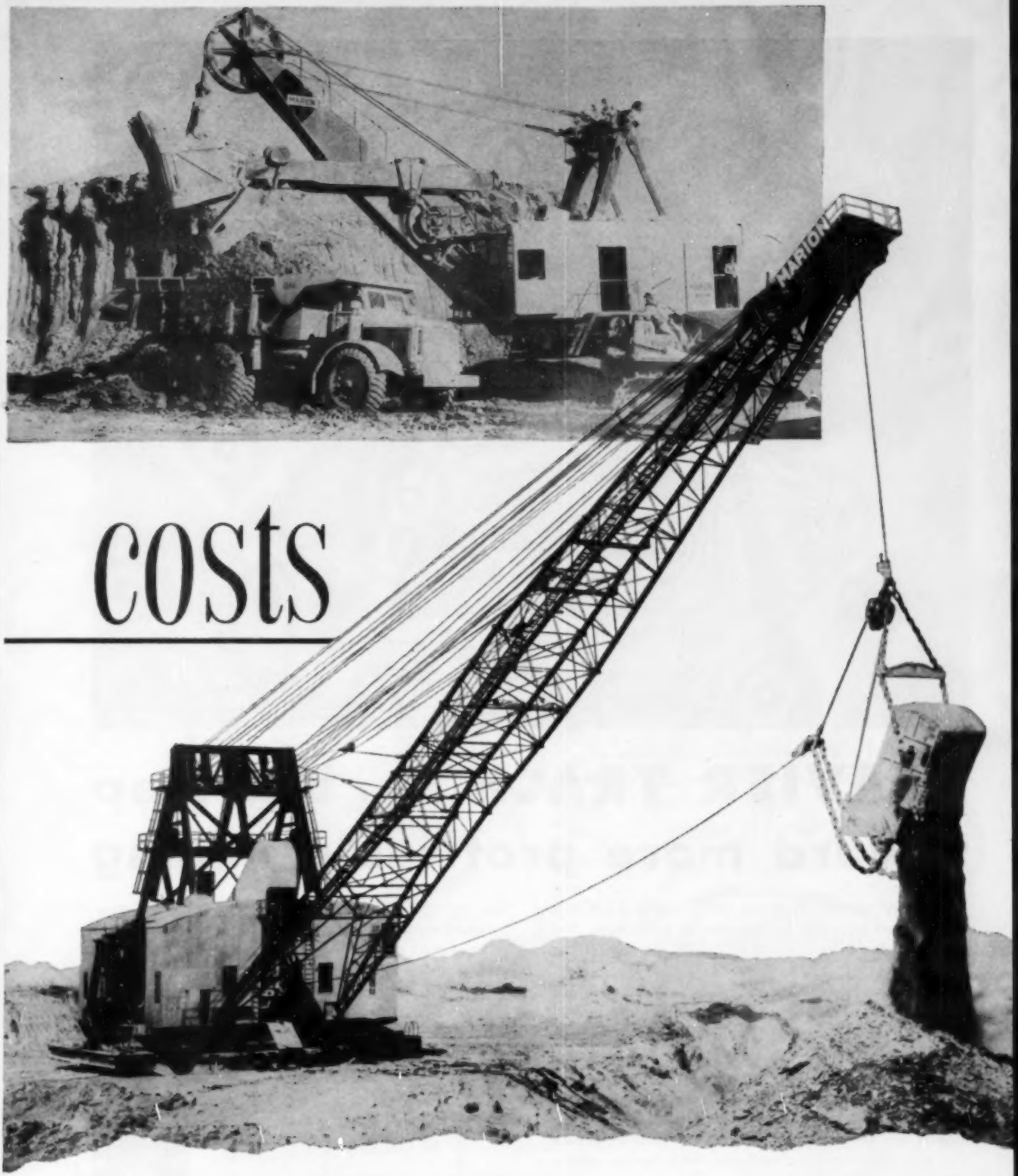
For more information or application data about USS High Strength Steels call or write our nearest office.

New Book gives complete story of



USS COR-TEN steel

Just off the press, this 58-page book is filled with factual data about USS COR-TEN steel. Contains many illustrations of interesting applications as well as physical properties and characteristics, and shows savings that can be affected through its use. Send for your free copy today.



costs

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS High Strength Steels

USS

4-1404

UNITED STATES STEEL

HEAVIER TRACK . . . big step toward more profitable mining

He's inspecting one of several newly installed turnouts prefabricated especially for his mine by Bethlehem. And if he sees that turnout in its full significance, he'll like what he sees.

For this is a heavy-duty turnout, built of rail weighing 80 lb per yard. That means longer life, carrying heavier loads in larger-capacity cars, with far less maintenance. In short, this Bethlehem turnout points to higher profit.

If your mine is one of the growing number where modernization is contemplated, a Bethlehem engineer can make valuable contributions to your plans. With your permission he'll visit your workings, talk over your ideas with you, and recommend the trackwork for a haulage system that will serve tomorrow as well as today.

When you hand Bethlehem your track problems, you rid yourself of all the exacting details. Our staff will design your system, figure the rail weights, tie-spacing, turnouts and crossings. Then they'll cut, curve and fit each piece to exact specifications at our plant to be sure it will make a perfect fit at yours.

The best part of all is that a Bethlehem layout is not a luxury item. Actually costs less in the long run than if you handled the job yourself. You'll be convinced after sitting down with a Bethlehem engineer. Contact him through our nearest sales office.

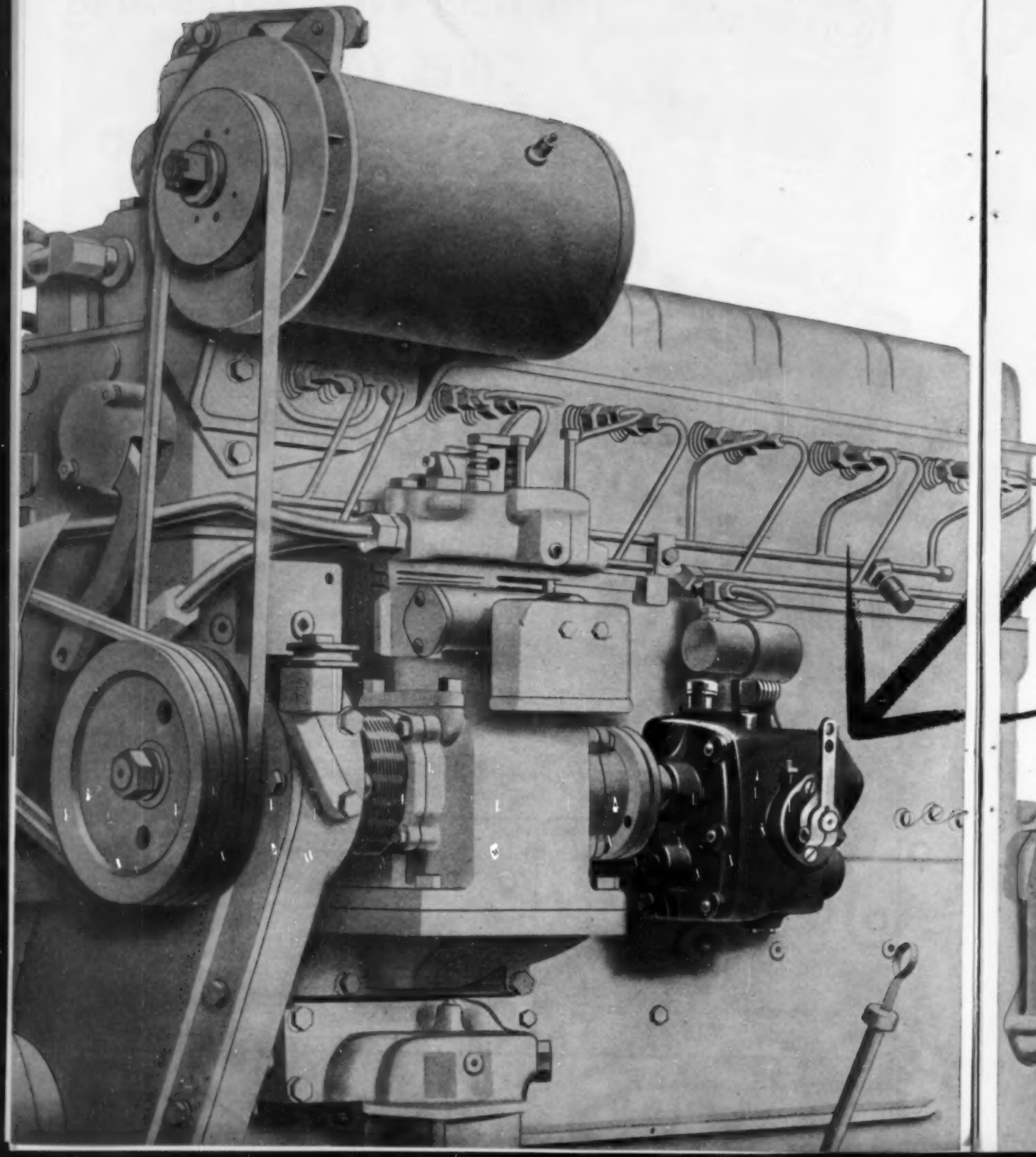
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

BETHLEHEM STEEL

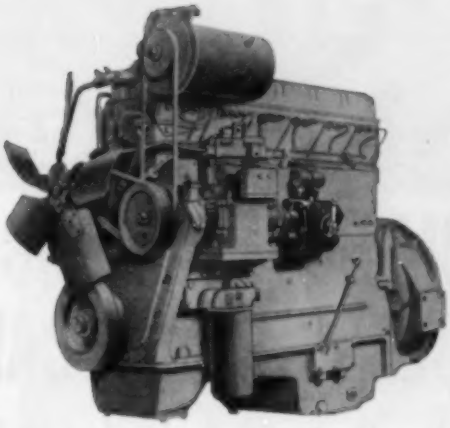
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM PREFABRICATED TRACK

Cummins new, exclusive diesel



fuel system needs no specialists!



PT Fuel System standard on all models...simpler to work with than gasoline carburetion and ignition

- Fuel system servicing costs become negligible.
- Compact pump weighs only 13 pounds—system has no fuel racks to adjust . . . no check valves, metering plungers, discs or floats—pump not timed to engine.
- Fewer parts thar any fuel system on any heavy-duty engine.
- Adaptable to all Cummins Diesels built since 1932.

Write for your copy of descriptive folder "Cummins PT Fuel System."

CUMMINS **Cummins**

Engine Company, Inc., Columbus, Indiana

Leader in rugged, lightweight, high-speed diesels (60-600 h.p.)

CUSTOM-BUILT AMERICAN ROLLING RING CRUSHER EXCEEDS RATED CAPACITY BY 32%!

Crushes Up to 80 Carloads (50 Ton Cars) per 7 Hour Day... Reduces Feed Size 8" x 1¼" Washed Coal to 1¼" x 0

This American AC-7-B Crusher was installed with a guaranteed capacity of 440 tons per hour. It has been operating at tonnages up to 584 tons per hour—and maximum output has never been reached, according to the mine's Director of Preparation.

THE REQUIREMENTS WERE:

- High capacity crushing.
- Flexibility in the sizing of the crushed product.
- Consistent sizing for any size feed up to 8"
- Minimum of fines.

Find out how your plant can maintain high production plus full sizing flexibility at low operating costs. Write for American AC Coal Crusher Bulletin.

THE RESULTS:

CAPACITY—Reducing 8"x1¼" to 1¼"x0, the American Crusher produced 584 TPH, a 32% increase over guaranteed capacity.

FLEXIBILITY OF SIZING—Whenever a 1" or 1½" product is desired, the sizing can be adjusted externally by means of the Adjustable Drop Cage. Further, the AC-7-B can be adjusted in less than two minutes to produce a 4"x0 product. This flexibility in sizing helps meet the changing market demands of this mine's contracts.

MINIMUM OF FINES—The crushed product, regardless of size being made, contained less fines than the requirements of the mine contracts.

. . . and for low-cost coal sample crushing

The American Sample Crusher, with the new Adjustable Sampling Hopper; gives you 5% — 10% — 15% or 20% sample of a sample — in one operation.

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 Macklind Ave., St. Louis 10, Mo.

Abolish "Waiting Around" Cable

Storing power cable like this is costly and unnecessary. The new power centers will help you eliminate such scenes. Thus you reduce the amount of cable in service and also keep it in better condition.

Simplex-TIREX PG and PCG Cables are designed especially to be used with this type of modern distribution system. As the working face advances, additional lengths of TIREX are coupled together. Only as much cable is used as is needed.

Elimination of using extra, "waiting around" cable just to have enough, results in substantial savings. Production jumps because less time is required to handle cable. Electrical safety increases through reduced electrical hazards.

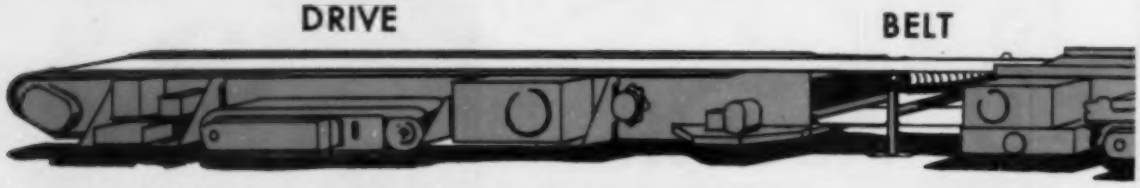
All the famous features are included in Simplex-TIREX PG and PCG Cables: the cured-in-lead jacket, the Selenium Neoprene Armor, the flexible stranding and "P-101-BM" markings. Your local TIREX distributor has these cables or can get them quickly.

Simplex

TIREX CORDS AND CABLES *are made only by the*

SIMPLEX WIRE & CABLE CO., 79 Sidney St., Cambridge 39, Mass.

ANOTHER JOY FIRST!

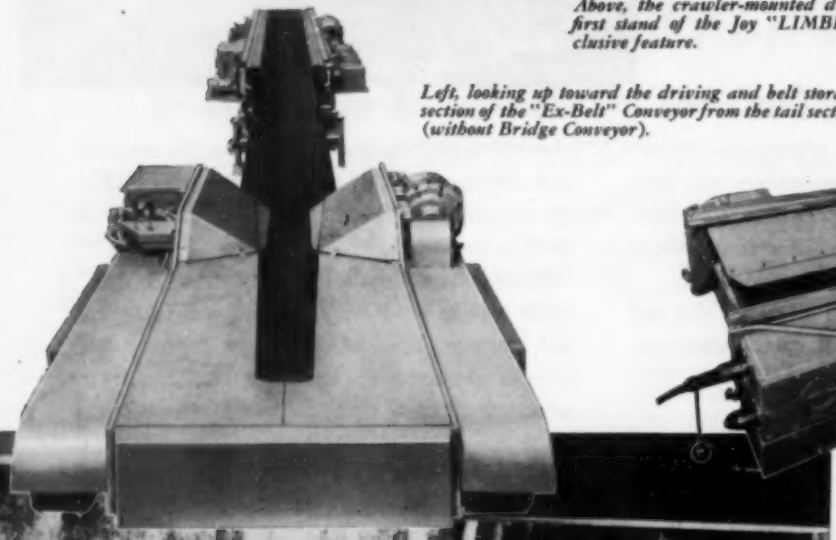


E-X-T-E-N-S-I-B-L-E

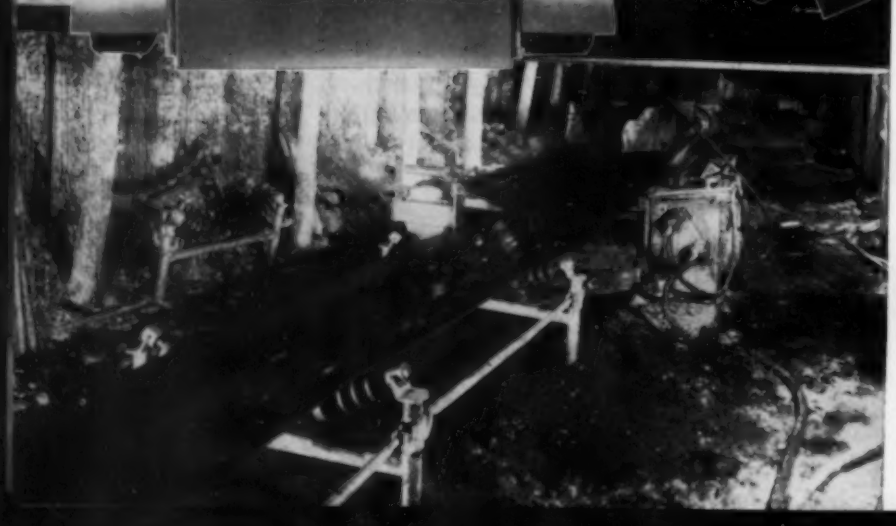
FOR TRUE CONTINUOUS HAULAGE

Above, the crawler-mounted driving section. At the rear is the first stand of the Joy "LIMBEROLLER" Idler system, an exclusive feature.

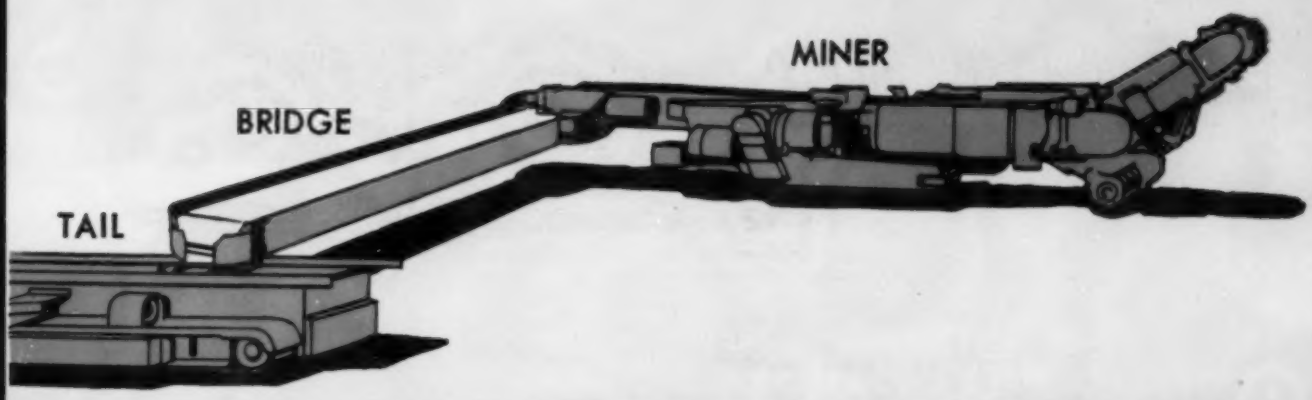
Left, looking up toward the driving and belt storage section of the "Ex-Belt" Conveyor from the tail section (without Bridge Conveyor).



Above, tail section with full-length hopper, track-mounted sliding carriage, and Bridge Conveyor which provides a flexible connecting link from a Continuous Miner (see drawing at top of page).



As the Continuous Miner advances while mining a room of 16-foot width, a continuous stream of coal moves away from the tail section and up the "Ex-Belt" Conveyor toward the camera. Note the perfect troughing of the belt and the smooth, steady action of the LIMBEROLLER idlers, rotating with practically no waver. Along the rib, note how the required idler stands and side rails for a 15' section of the belt stack compactly between timbers.



BELT CONVEYOR

FROM CONTINUOUS MINING MACHINES

EXTENDS OR RETRACTS 50 FT. UNDER FULL LOAD

With the Joy "Ex-Belt" Conveyor, once again we have broken into new ground in our continuing development of the science of mechanized mining. Once again a Joy field-proved unit gives you a real opportunity to make another important reduction in your production cost-per-ton . . . the saving you need to maintain or increase your profit margin today.

The Extensible Belt Conveyor now, *for the first time,* gives you a continuous haulage system for Continuous Miners in driving rooms and entries up as far as 1,000 feet, including breakthroughs and taking pillar on retreat. Available in 24", 30" or 36" widths, it consists of two main units: a driving section and a tail section, both of which are self-propelled on identical crawler treads. It extends or retracts 50 feet while operating under full load, and belt tension and slippage are under automatic control at all times. A 100-foot length of belt can be added or removed, as needed, in an average time of only 5.3 minutes; and the entire system can be moved over and set up for a new heading in less than 2 hours.

Perhaps most important of all, the Extensible Belt Conveyor follows the Joy tradition of simply-designed, rugged, foolproof equipment that can take the heaviest duty underground and stay on the job month in and month out. That is your final assurance of securing the favorable cost basis and production rates for which the Joy "Ex-Belt" was developed. ***Joy Manufacturing Company Oliver Bldg., Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ont.*

WRITE FOR BULLETIN J-303

TYPICAL FIELD PERFORMANCE

In an Eastern Ohio mine, operating in 54"-60" coal (Ohio #8 seam), a Joy Continuous Miner and Extensible Belt Conveyor team permitted the driving of rooms 16 ft. wide to a depth of 600 ft. Average production rate for panels of seven rooms varied from 302.3 to 325.4 tons per shift. Average time required to change over equipment was 1¾ hours (from shut-down in one room to start-up in the next).

Consult a Joy Engineer

W&D CL8362

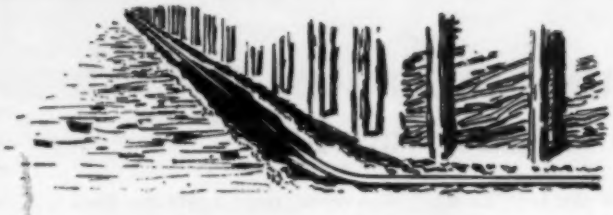
JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

Expose it to sun and heat...

Pull it over rocks and shale...

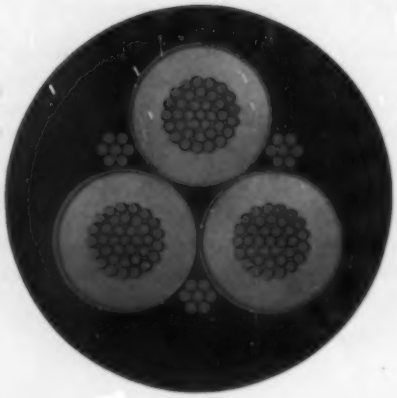
Trench it in presence of acid water...



Through it all—

Anaconda's tough **MINE POWER CABLE**

keeps power flowing



This easy-to-splice cable is built for heavy duty. It saves you money. It handles well. And it lasts longer – with fewer power interruptions, less maintenance trouble.

Here's why:

BUTYL INSULATION has high dielectric strength . . . superior long-aging characteristics . . . and excellent resistance to moisture, ozone, and heat.

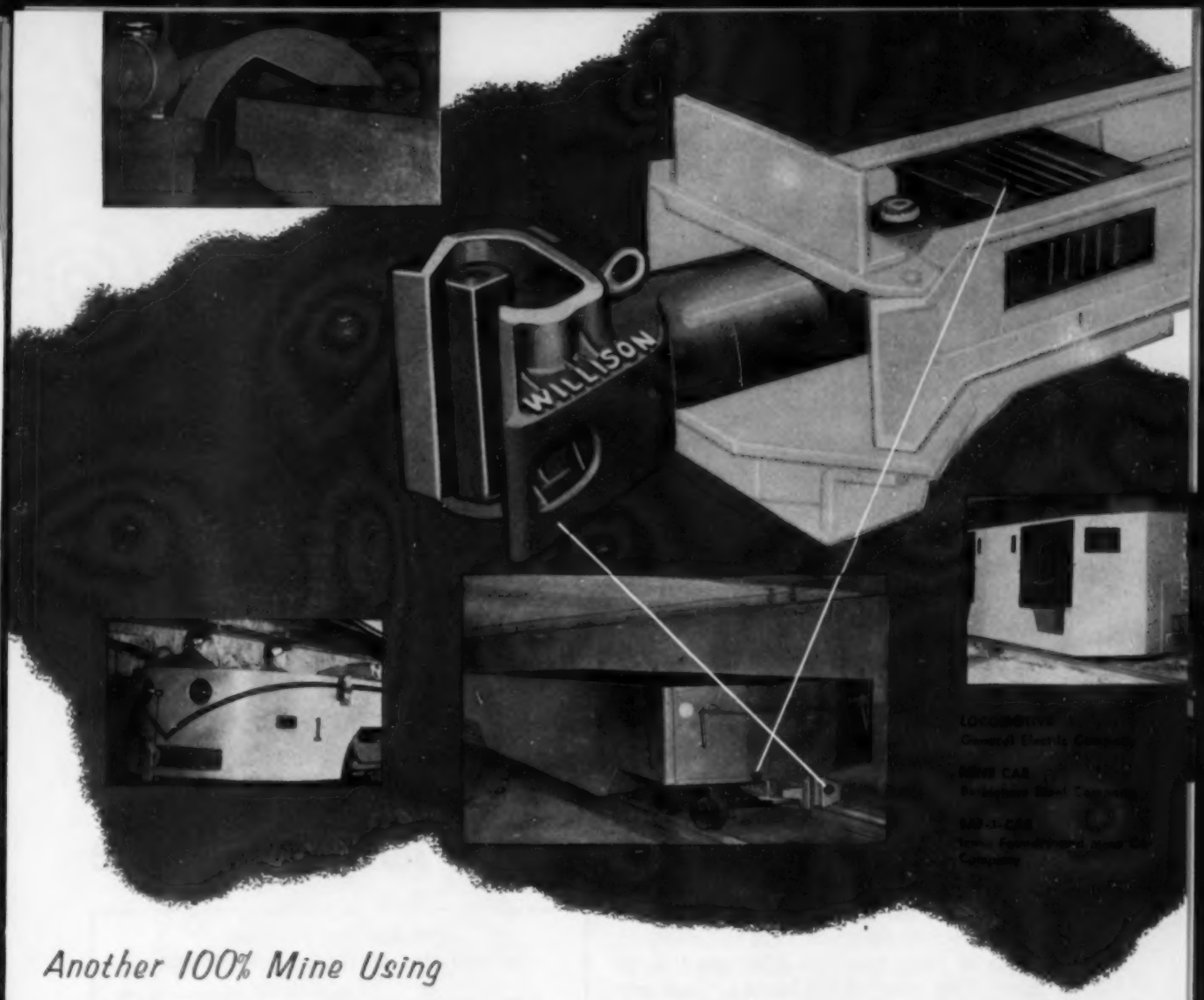
NEOPRENE JACKET is tough . . . has real flexibility and great strength . . . and is resistant to flame and corrosive mine water.

See your nearest Anaconda Sales Office or Distributor for full information about this durable, low-cost Mine Power Cable. Do it today! *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

5430

the right cable for the job

ANACONDA® **WIRE AND CABLE**



Another 100% Mine Using

WILLISON AUTOMATIC COUPLERS FOR SAFE COUPLING and NATIONAL RUBBER DRAFT GEARS FOR SHOCK CONTROL

Every mine car, every locomotive and every personnel car in the Jamison Coal and Coke Company Mine No. 9 operation is so equipped.

Willisons couple automatically with each other for faster, safer handling—no matching of coupler heads; can be uncoupled from either side by a turn of the uncoupling rod—no personnel between cars.

National Multi-Pad Rubber Draft Gears give impact protection and smoother train operation—for reduced spillage and longer car life.

FOLDER 5452 *Available on Request* A-1078

Technical Center
Cleveland

"Progress through Research"

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

Cleveland 6, Ohio

WILLISON AUTOMATIC COUPLERS • RUBBER & FRICTION DRAFT GEARS • NC-1 CAR TRUCKS • NACO STEEL WHEELS • NACO STEEL LINKS & SWIVEL HITCHINGS

Four TR-200's work up to 460 hours a month . . . average only 4 hours down time

In less than a year, the George W. Kerford Quarry Company, Atchison, Kansas, put 3,828 hours of work time on each of their four Allis-Chalmers TR-200 Rock Wagons. They piled up 460 hours a month over one five-month period. During the year, service down time for each unit averaged only 4 hours a month . . . this means that each rock wagon was on the job over 98 percent of working time!

The TR-200's have been hauling quarry stone from the pit to a crushing plant 1½ miles away. Loads average 16 tons and each cycle is completed in 14 min. Fuel consumption has been about 3¼ gal per hour with no oil needed between changes.

George E. Kerford states, "We like the TR's maneuverability and easy control, which makes it possible for any good truck driver to learn to drive the outfit quickly. The wagon body is well constructed and cleans easily and completely. We find that most parts needing frequent maintenance and repair are easily accessible."

HERE ARE THE FEATURES BEHIND THIS OUTSTANDING RECORD

Big bowl top makes excellent target for shovel or dragline operator, helps loading under bins or chutes.

High power-to-load ratio of 16 hp per yard of capacity speeds hauling, helps on steep grades.

Maximum lift angle of 70 degrees speeds dumping of any type material. Big opening and "bathtub" design slide loads out fast at minimum dump angles.

Dumps 30 in. back of rear wheels to put entire load over banks or into hoppers.

Wheel base stays fixed during dumping cycle for greater safety on banks, accuracy in spotting loads.

Four-wheel air brakes allow full control, safer dumping over banks.

Hydraulic control system raises or lowers bowl while traveling, gets TR-200 into position sooner.

176 hp engine — 5 speeds forward to 21.6 mph, reverse 2.5 — 11 yd struck, 15 yd heaped, 18 tons

Write for complete catalogs or ask your Allis-Chalmers dealer for a demonstration

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

here's how one TSP sprocket has saved $5,222.00

THE VALLEY CAMP COAL COMPANY, Maidsville, West Virginia installed a "Tool Steel Process" drive sprocket on the coal tipple car elevator in August, 1950. It's still in service!

A competitive sprocket (costing the same amount as the TSP sprocket) previously used in the same service lasted *only three months!*

The Valley Camp Coal Company's tipple foreman states: "Based on present rate of wear, our TSP sprocket should have a service life of *at least 10 years.*" Estimating sprocket cost plus a periodical labor charge for replacement of the competitive product, this one TSP sprocket installation has already saved 18 times its cost and has saved this company a total of $5,222.00 so far -- and savings are still piling up!

TSP SPROCKETS are hardened by our special process. The file hard surface to the full depth of permissible wear gives maximum life. In addition, the TSP smooth surface reduces wear on chains. The core, refined for toughness and ductility, gives maximum strength. You receive an absolutely positive written guarantee that TSP products will give a longer life in the same service than any other product.

Our comprehensive Bulletin No. 1153 shows many applications for TSP products in the Mining Industry. Write today.

THE TOOL STEEL GEAR AND PINION CO.
CINCINNATI 16, OHIO, U. S. A.

AD 150

The World's Standard of Quality Since 1909 for Gears • Pinions • Rolls • Wheels and Other Hardened Products

NEW CHEVROLET TRUCKS

shorten your schedules and cut costs in the bargain!

You can actually count on a Chevrolet truck doing your job faster and for less money. That's a strong claim, sure; but one that's been proved time after time on job after job.

EXTRA POWER SAVES YOU TIME

All three Chevrolet truck engines—the "Thriftmaster 235," the "Loadmaster 235" and the "Jobmaster 261"*—deliver extra horsepower for greater acceleration and hill-climbing ability. You haul your loads on a time-saving schedule and save money doing it—for with Chevrolet's higher compression ratio you use less gas.

BUILT-IN RUGGEDNESS SAVES YOU MONEY

Stronger, more rigid frames, newly designed clutch; huskier rear axles and drive lines in 2-ton models; higher capacity universal joints in medium- and heavy-duty models—these beefed-up built-in chassis features mean your Chevrolet truck is going to stay on the job for a longer time. They also mean you can expect extra-low operating costs.

Another important advantage is Chevrolet's low original cost—lowest of all lines of trucks! You save the day you buy, and you go right on saving as long as you own that Chevrolet truck. Drop by your Chevrolet dealer's and look over the many models he has to offer. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

MOST TRUSTWORTHY TRUCKS ON ANY JOB! CHEVROLET

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT***—eliminates back-rubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

**Optional at extra cost. Ride Control Seat is available on all cabs of 1½- and 2-ton models, standard cabs only in other models. "Jobmaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.*

FASTER DEWATERING OF COAL FINES ON AGIDISC FILTERS

This filter produces about 35 tons dry cake per hour and does not run to capacity.

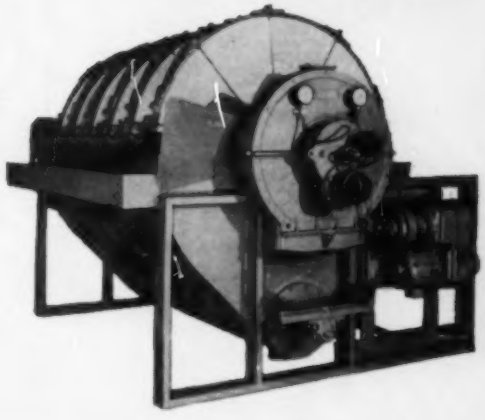
Close up of cake at discharge not retouched.

More tons per square foot of filter area and less moisture content in the cake are two of the features which make Eimco Agidisc filters superior in the fine coal dewatering business.

Hidden values in the Eimco filter are just as important as those that are obvious. Eimco filters are heavier, better designed units for long years of trouble-free operation. They require less maintenance and provide lower operating costs.

Eimco filters will produce a filtrate clear enough to satisfy any polution standards.

Our Research and Development Division is continuing its fine coal research. Let us apply this information to your fine coal dewatering problem.



Eimco Agidisc filter with metal cloth bags.

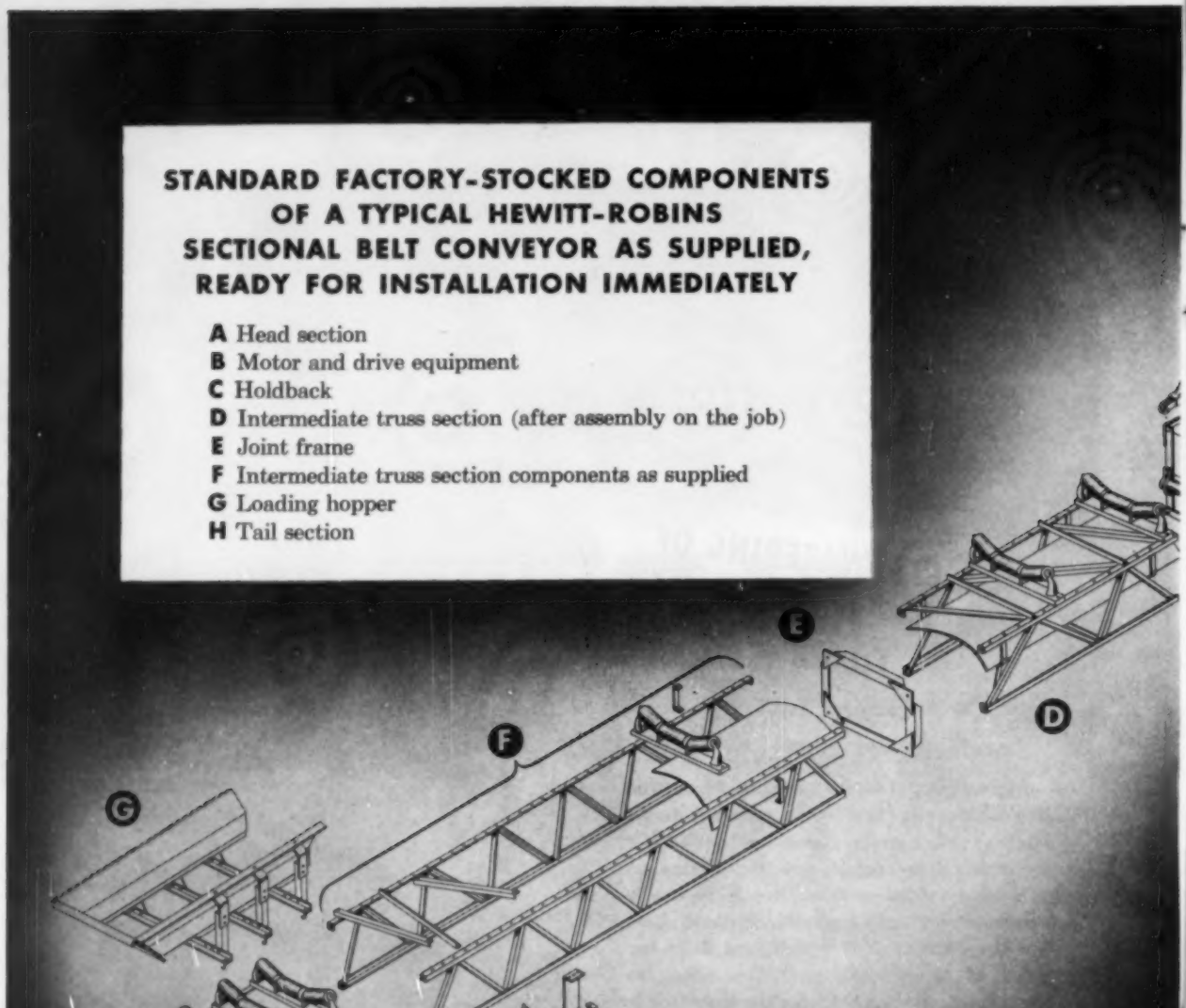
THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. London, Eng. Paris, France Milan, Italy

You Can't Beat An Eimco

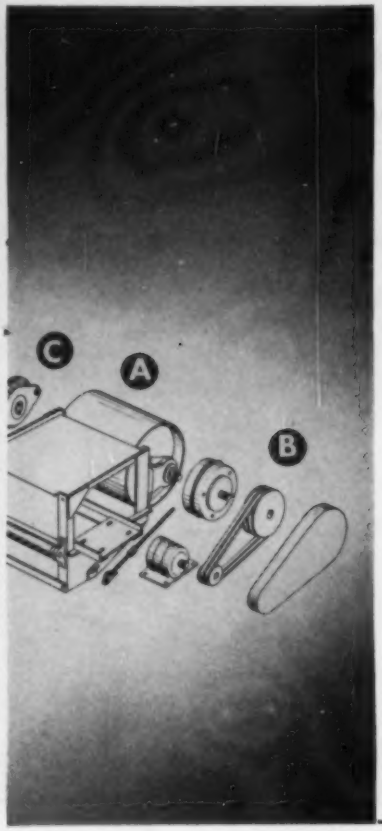
Order Your Belt Conveyor



HEWITT-ROBINS

EXECUTIVE OFFICES, STAMFORD, CONNECTICUT

Right From Factory Stock



Save Time and Money . . . Install your own Hewitt-Robins Sectional Belt Conveyor from Easy-to-assemble Factory-built Components

Now, for the convenience of large and small plant operators alike—Hewitt-Robins offers a standardized sectional conveyor adaptable to a wide variety of uses.

Hewitt-Robins Sectional Conveyors consist of completely assembled factory-stocked components that can be quickly and economically installed and maintained by your own personnel.

When you order a Hewitt-Robins Sectional Conveyor you can be sure of prompt delivery . . . all components and parts from machinery to belting are shipped to you direct from standard factory stocks . . . saves you time and saves you money.

For prompt information about the Sectional Conveyor and any other Hewitt-Robins bulk material handling products, contact the Hewitt-Robins office nearest you or write direct to Passaic, New Jersey.

ENGINEERING DATA

APPLICATION: Designed to handle bulk and packaged materials where special limitations and conditions do not require the use of custom-engineered belt conveyors.

MATERIALS HANDLED: Sand, gravel, run-of-mine ore, coke, stone, coal, gypsum, grain, sugar beets and any other bulk materials that can be handled more efficiently and economically by belt conveyor.

CAPACITIES: From 20 to 500 TPH at belt speeds from 200 to 450 feet per minute.

STANDARD WIDTHS: 18", 24", 30", 36".

LENGTH: From 15'6" up to any length consistent with good conveyor practice . . . inclines up to 22½°.

STANDARD HORSEPOWER: From 2 to 30 hp.

IDLERS: 4" or 5" diameter troughing and return idlers available. Both types have exclusive Hewitt-Robins patented Triple Grease Seal and one-shot lubrication.

BELTING: Complete selection of all Hewitt-Robins standard stocked belts. Special belts available when necessary.

INSTALLATION: All standard factory-assembled components are clearly labeled and shipped with complete instructions, for quick, easy assembly by your own personnel.

Write for Bulletin #132-B on your company letterhead

Here is a partial list of
HEWITT-ROBINS PRODUCTS
that will help you cut handling costs and increase operating efficiency

MACHINERY:

- Belt Conveyors
- Belt & Bucket Elevators
- Car Shakeouts
- Screen Cloth
- Vibrating Conveyors & Screens

INDUSTRIAL RUBBER PRODUCTS:

BELTING:

- Conveyor
- Elevator
- Transmission

HOSE:

Hewitt-Robins makes over 1,000 different types of industrial rubber hose, including Twin-Weld®, the patented twin-line welding hose.

For information and service on industrial rubber products, contact your Hewitt-Robins Industrial Supply Distributor. Through his complete stock of Hewitt-Robins Rubber Products, and his familiarity with local field conditions, he can fill your supply needs promptly and correctly. See Classified Phone Book for the Hewitt-Robins Industrial Supply Distributor serving your area.

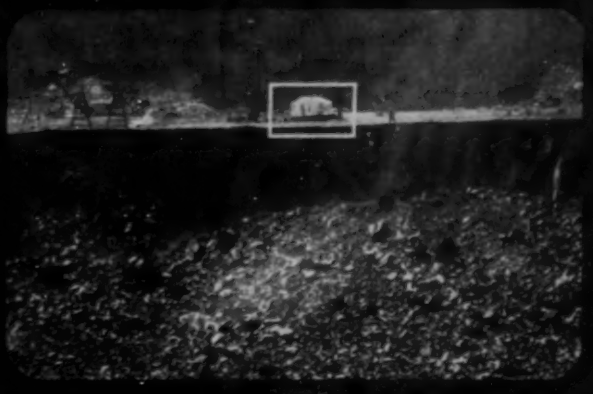
3081

INCORPORATED

DOMESTIC DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Restfoam
FOREIGN SUBSIDIARIES: Hewitt-Robins (Canada) Ltd., Montreal • Hewitt-Robins Internationale, Paris, France • Robins Conveyors (S. A.) Ltd., Johannesburg • **EXPORT DEPARTMENT:** New York City.

"Less shake...

Less noise...



No broken glass..."

WITH the help of the ROCKMASTER® blasting system and a greenhouse, the North Jersey Quarry Co., Millington, N. J., has built good community relations. They proved to nearby neighbors that their blasting produces less vibration in a dwelling than that of a slammed door.

The greenhouse is only 48 feet from the quarry face. Yet after the blast there wasn't a single crack in a pane of glass . . . the concrete foundation was in perfect condition. That is convincing evidence for any neighbor worried about his home.

By initiating the blast at the bottom of the holes . . . the point of maximum confinement . . . the ROCKMASTER blasting system keeps the explosive force confined where it does all its work on the rock. There is minimum air blast, no wild flying rock, no wasted explosives power . . . a well broken, easy-to-dig pile is the final result.

For quarrying, mining and construction work, see how ROCKMASTER can increase your blasting efficiency and improve your public relations. Ask your Atlas representative for a copy of the new Atlas Explosives Catalog that is just off the press.

BLAST DATA:

Number of holes	9
Average depth	56′
Spacing	17′
Burden	6 to 20′
ROCKMASTER delays	0 through 8
Average stemming	17′
Diameter of holes	6″
Total powder (Apex #4 HV and #2 MV)	3025 lb.
Rock produced	14,000 Tons
Powder factor	4.63
Loading started	8:30 AM
Loading finished	10:30 AM
Blast fired	11:15 AM

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY,
WILMINGTON 99, DELAWARE

Offices in principal cities

Cleveland-Cliffs Iron Co. reports:

Belts reinforced with Du Pont "Cordura" give trouble-free performance 16 hours a day

Over-all view of Canisteo Mine conveyor-belt system. Belts reinforced with Du Pont "Cordura" carry crude iron ore up this 18° slope . . . hug the center idler for better troughing and training throughout the run.

Steady production at the Canisteo Mine, Coleraine, Minn., depends on the performance of conveyor belts like the one shown above. The belts, reinforced with Du Pont Cordura® High Tenacity Rayon, transport an average of 900 tons of crude iron ore from pit to wash plant every hour—stand up well under rugged 16-hour workdays.

The Cleveland-Cliffs Iron Co., which operates the mine, reports that the "Cordura" reinforced belts have given highly satisfactory service since their installation. Manufactured by the B. F. Goodrich Co., the belts have needed no maintenance to date. The *extra* strength of Du Pont "Cordura" permits a belt that's thinner, yet stronger. And the low stretch of "Cordura" reduces expensive downtime for take-up and resplicing.

Consider "Cordura" before ordering *your* next conveyor belt. Write us for names of suppliers . . . and send for your *free* copy of the new booklet "Mine & Quarry Facts About 'Cordura'." Address: E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

®REG. U.S. PAT. OFF.

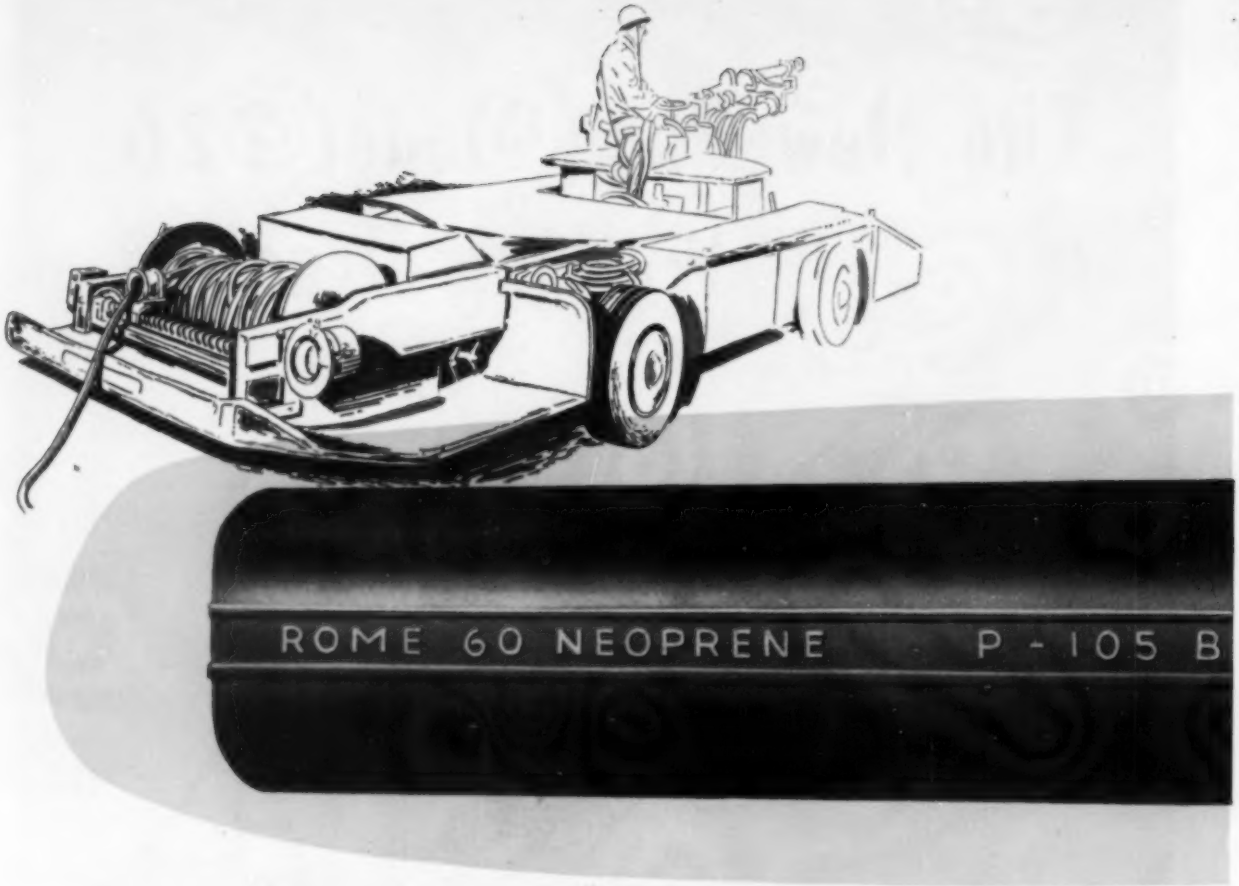
Du Pont "*Cordura*" High Tenacity Rayon

STRENGTH AT LOW COST

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

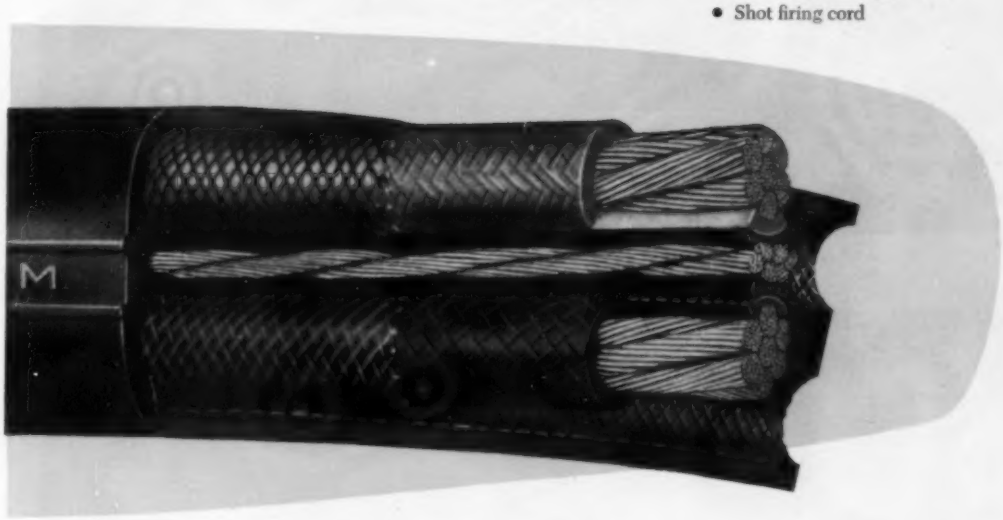


Want more tons per cable?

Do It Better—Do It Electrically
National Electrical Week, October 18-25

Quality mine cables and cords

- Multiple-conductor power cables—Type W and G
- Type SO portable cords
- Single-conductor locomotive cables
- Mine power distribution cables
- Shovel and dredge cables
- Shot firing cord



Then read this

These 5 service advantages will help you get more tonnage per cable dollar

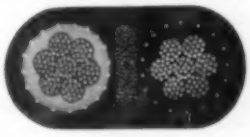
You can reduce the cost of cable failure . . . by buying the best.

You know that cable failure means (a) lost tonnage, (b) downtime, (c) idle machinery, (d) repair expenses, (e) cable replacement expense. Add all these together and the cost of the best cable is low, because it lasts longer. It reduces the number of failures.

Here's how you can tell the best. Check this list of advantages you will gain with Rome 60 parallel duplex mine cable.

1. FLEXIBLE—Tough Neoprene webbing separates grounding conductor from insulated conductors. This gives you . . . high impact resistance, low conductor fatigue, better protection against "shorts," and maximum flexibility.

2. INTERLOCKED CONSTRUCTION—This cross-section shows what interlocked construction is . . . the open braid around each conductor locks the conductor to the Neoprene sheath. Twisting, pulling or flexing will not separate conductors from the sheath.



3. OVERLOAD PROTECTION—The insulation is compounded for heat resistance to permit continuous operation at 167°F. (75°C.) which is adequate protection against deterioration under high overloads.

4. NEOPRENE SHEATH—The tire-like toughness of the molded-in-lead Neoprene sheath protects your cable against impact, acids, oils, abrasion and flame.

5. MEETS MINING CODES—The surface marking "P-105 BM" means that Rome 60 mining cable conforms to State of Pennsylvania and Federal Bureau of Mines Safety Codes.

When you invest in Rome 60, you make your total investment in men and machinery pay off best. Prove it to yourself. Order Rome 60 today.

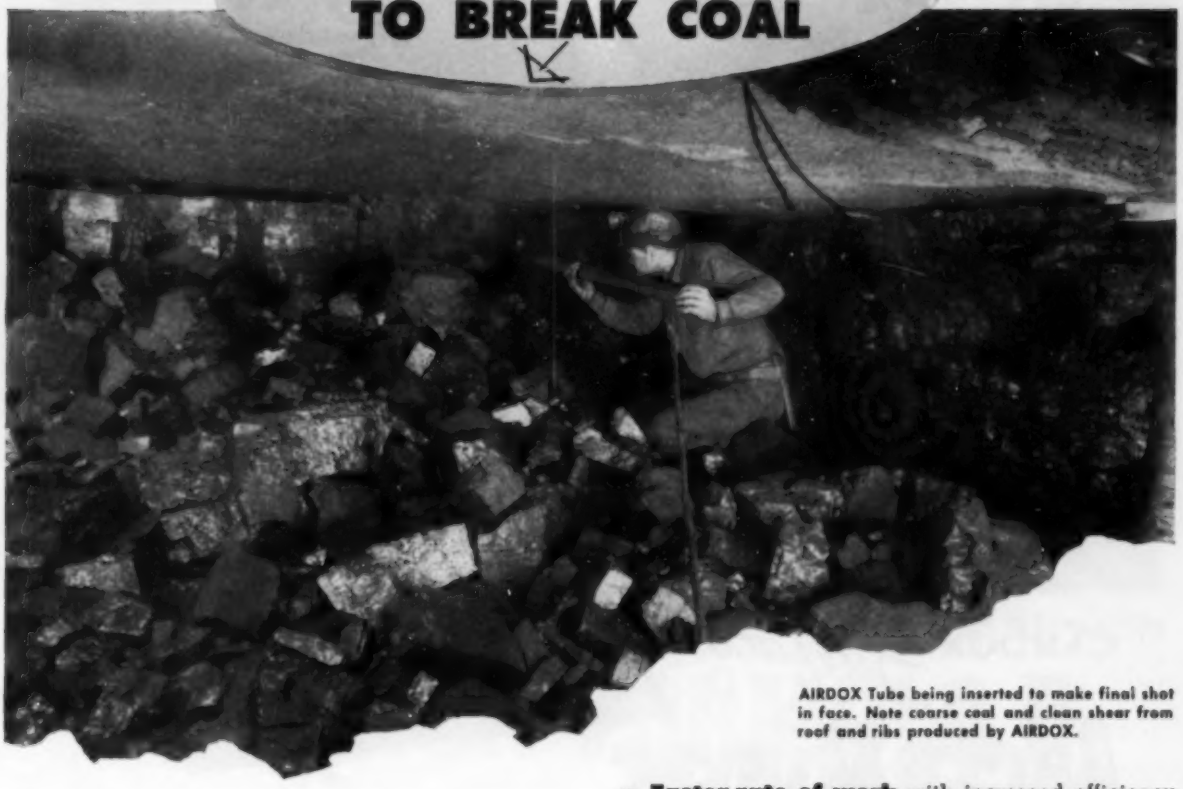
It Costs Less to Buy the Best

ROME CABLE Corporation
ROME · NEW YORK
and
TORRANCE · CALIFORNIA

Another Mine Proves AIRDOX

NON-EXPLOSIVE MINING METHOD

is the SAFEST, CHEAPEST WAY TO BREAK COAL



AIRDOX Tube being inserted to make final shot in face. Note coarse coal and clean shear from roof and ribs produced by AIRDOX.

In this mine located in the Pittsburgh Seam, AIRDOX Non-Explosive Mining teamed up with modern equipment and methods, is proving conclusively its ability to produce quality coal at lowest possible cost.

In emphasizing the savings and advantages of AIRDOX, the operators of this mine cite the following benefits:

1. **Excellent loadability** insures high production with less maintenance on loading machines.
2. **Minimum shattering** of roof strata with a roof far superior to that of previous years.
3. **Firm, square faces and ribs,** with less sluffing of coal.
4. **No smoke and fumes** and no delay in face cycle waiting for smoke to clear away.
5. **Faster rate of work** with increased efficiency and production of more than 10 tons per payroll employee.
6. **Less fines,** plus increase in overall size in the product, increases cleaning plant capacity and improves realization because plant losses are cut down.
7. **Greater safety** than with any other method of breaking coal.

This is just one of scores of mines in which AIRDOX has shown itself to be the most economical and safest way of breaking coal.

If you are not now using AIRDOX Non-Explosive Mining, why not find out how much it can improve your operation and cut your costs? Write and we'll arrange a free survey, at no obligation to you.

CARDOX CORPORATION • **BELL BUILDING** • **CHICAGO 1, ILLINOIS**

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Phone: St. Clairsville 619

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Phone: Library Colonial 3-6910

Camden-on-Gauley, W. Va.
Phone: Camden-on-Gauley 2181

Evansville, Indiana
307 Northwest Fifth St.
Phone: Evansville 2-8944

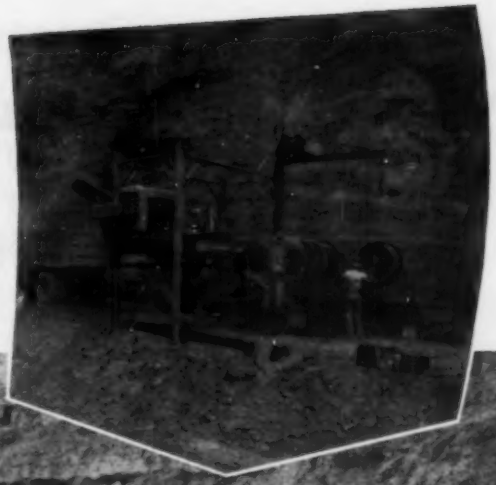
Pikeville, Kentucky
Route 2, Box 99
Phone: Robinson Creek 5

Louisville, Colorado
Phone: Boulder
Hillcrest 2-7298

Ottumwa, Iowa
Phone: Ottumwa
Murray 4-6564

profitable production doesn't have to stop when your mine is

"stripped-out"



drill

bonus tonnage from seams buried by excessive overburden

CARDOX *Surface* AUGERMINERS

When excessive overburden stops stripping, you can still mine coal profitably—and without extra development expense! Drilling 100 ft. or more with Cardox Surface AugerMiners into *already exposed* seams extends your mining operations—nets you as much as 50 tons of coal per man-shift that otherwise would have to be left behind. And it's high grade coal, too. Vertical direction control keeps auger in the best part of coal seam, away from rock and shale. A choice of cutterheads helps determine size. Coal comes out in a steady flow, convenient for loading by mechanical means. A full description of CARDOX AugerMiners and facts about how they can help you *continue profitable production* are available in a free AugerMiner bulletin. Write for it—or see your Cardox representative.

***NOW*—CHOOSE YOUR POWER**

Either 155 HP gasoline or diesel engines are now available on AugerMiners. Drills hole up to 38 in. in diameter.

CARDOX CORPORATION ● BELL BUILDING • CHICAGO 1, ILLINOIS

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Pikeville, Kentucky
Route 2, Box 99
Phone: Robinson Creek 5

Louisville, Colorado
Phone: Boulder
Hillcrest 3-7298

Ottumwa, Iowa
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Murray 4-6564

Let it sleet! Let it snow!

YOU STILL CAN HAVE
FREE-RUNNING COAL...
SATISFIED CUSTOMERS

Freezeproof your coal with

MORTON FORMULA 5

Eliminate costly delays in unloading frozen coal. Keep your customers completely satisfied by shipping them coal freezeproofed with Morton "Formula 5." It saves them time, labor, and money.

Morton "Formula 5" is an inexpensive, free-pouring, dry product composed of sodium chloride (30-70 mesh) and a special anti-corrosive compound.

"Formula 5" is effective at subzero temperatures. Needs no mixing, no extra handling. Apply dry, direct to coal.

- **Harmless to coal, harmless to hands and clothing of workers**
- **Can be used for conveyor equipment, switches, tracks, etc.**
- **Readily available—comes in tough, 100-lb. bags**

Informative free booklet
Send for your copy today

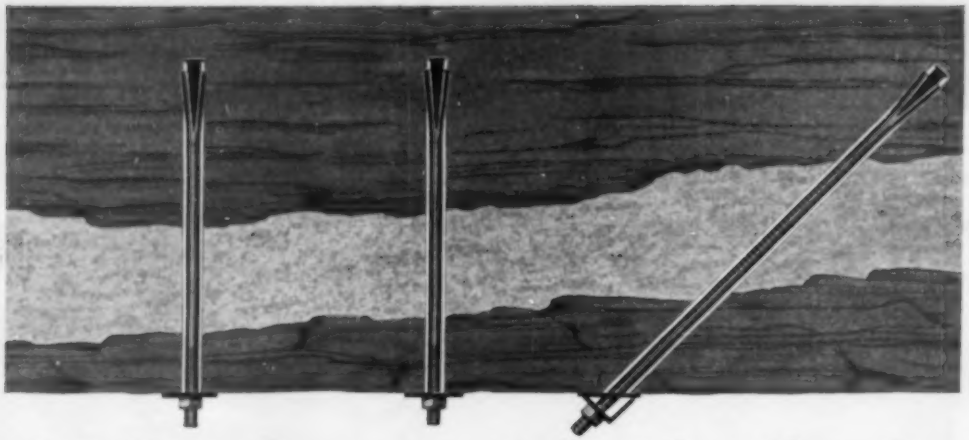
You get all these extra benefits with the only freezeproofing product made exclusively for the coal industry—Formula 5

- **Scientifically treated to produce an ideal dissolving rate and minimize loss during initial draining**
- **Will not lump in feeder**
- **Contains a rust inhibitor to protect your equipment**

MORTON SALT COMPANY, Industrial Division
Chicago 3, Illinois, Department CA-9

Please send me your free booklet on "Formula 5."

Name_____
Company_____
Street_____
City_____ Zone____ State_____



Roof Bolting Promotes Safety by Clamping Roof Strata into Thick Beam

HOLDS STRATA AS SINGLE UNIT

Roof bolting makes any mine a safer, more productive mine. This is because the bolts consolidate several strata into a single-unit thick beam.

Besides providing increased safety for workers, roof bolting also helps to step up production, because there are wider clearances and increased room in which to operate mechanized equipment. Ventilation is improved, too.

To facilitate economical roof bolting, Bethlehem manufactures a slotted bolt, which is used with a steel wedge; also three types of roof bolts for use with expansion shells. All four types of bolts come in lengths of from 2 ft to 8 ft. For additional details, get in touch with the nearest Bethlehem office.

SLOTTED BOLT A 1-in. bolt having a centered, forged slot. No material is removed when slotting. Other end of bolt has 5 in. of rolled threads. Intended for 1¼-in. hole. When bolt is driven against back of hole, steel wedge is forced deep into slot, expanding ends of bolt. Truncated-cone point prevents thread damage. Usually supplied with American Standard Regular Square Nut.

SQUARE-HEAD ROOF BOLTS (Three types)

1. Square-head ¾-in. carbon-steel bolt.
   Minimum breaking load, 20,000 lb.
2. Square-head ⅞-in. high-strength bolt.
   Minimum breaking load, 20,000 lb.
3. Square-head ⅞-in. high-strength bolt.
   Minimum breaking load, 40,000 lb.

Bethlehem's square-head bolts come with or without ears on the shanks, to accommodate the Bethlehem 4-leaf Type C expansion shell, or the matching-halves Type F expansion shell.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM MINE ROOF BOLTS

It's PENTAERYTHRITETETRANITRATE . . . and it shoots at four miles a second!

"20,350 feet, to be exact. That's *fast* – but not too fast to permit relief of burden. I lay out my shots so that front line holes go a fraction before succeeding lines. I get better fragmentation – easier digging.

"Another thing – I always use the *right* Primacord for the job. Primacord is made in three types:

Plain – for small bore or shallow holes and trunk lines.

Reinforced – for deep holes. It's got a tough cover.

Wire Countered – for very deep, ragged holes, or with heavily reinforced explosives containers.

Plastic Reinforced – in river crossings, deep holes – or when field shots must stand a long time before blasting.

"I get good results every time because I always choose my Primacord as carefully as I use it."

P-11

See your explosives supplier or write for information to

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut

Also Safety Fuse since 1836

PRIMACORD® *detonating fuse*

PROVED and APPROVED

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

SEPTEMBER, 1954

IVAN A. GIVEN, EDITOR

Power Through Concentration

IT BECOMES CLEARER day by day that the coal industry is moving steadily toward better organization to meet today's problems and lay the foundation for future progress. The bedrock executive sessions on how to achieve these goals continue, and include taking the problem apart for a closer look at its parts as a means of arriving at a better organization and better methods for reaching a sound solution. This was the method followed by Appalachian Coals, Inc., in its bulletin of July 29, in reaching the conclusion that if the bituminous industry is to remain in a position to serve the Nation as it may be called upon to do—including fueling a defense effort, if one should be necessary—it must maintain developed mines at or near present capacity. To do this, the bituminous industry needs to produce approximately 550,000,000 tons per year. ACI then points out that the logical way of maintaining this production is by:

"1. Congress restricting the importation of foreign residual oil which will displace about 50 million tons of coal per year at present rates.

"2. The administration arranging for Marshall-aid countries to buy American coal. (Why should western Europe buy millions of tons of coal from Iron Curtain countries when American coal is competitive?)

"3. Amending the Natural Gas Act to permit and encourage natural gas to sell at its true economic value in the markets. (It is selling today at the well for one-fifth the price of crude oil and two-fifths the price of coal at the mine.)

"4. The railroads, in cooperation with the government, reducing their freight rates on coal so that they will return not more than the cost of hauling plus a reasonable profit. (Today they are set up to carry the losses of passenger and dining-car traffic, and on other commodities.)

"5. Adjusting wage rates and fringe benefits to be competitive with other industries, particularly the oil and natural-gas industries.

"6. Providing additional sound leadership in the industry itself.

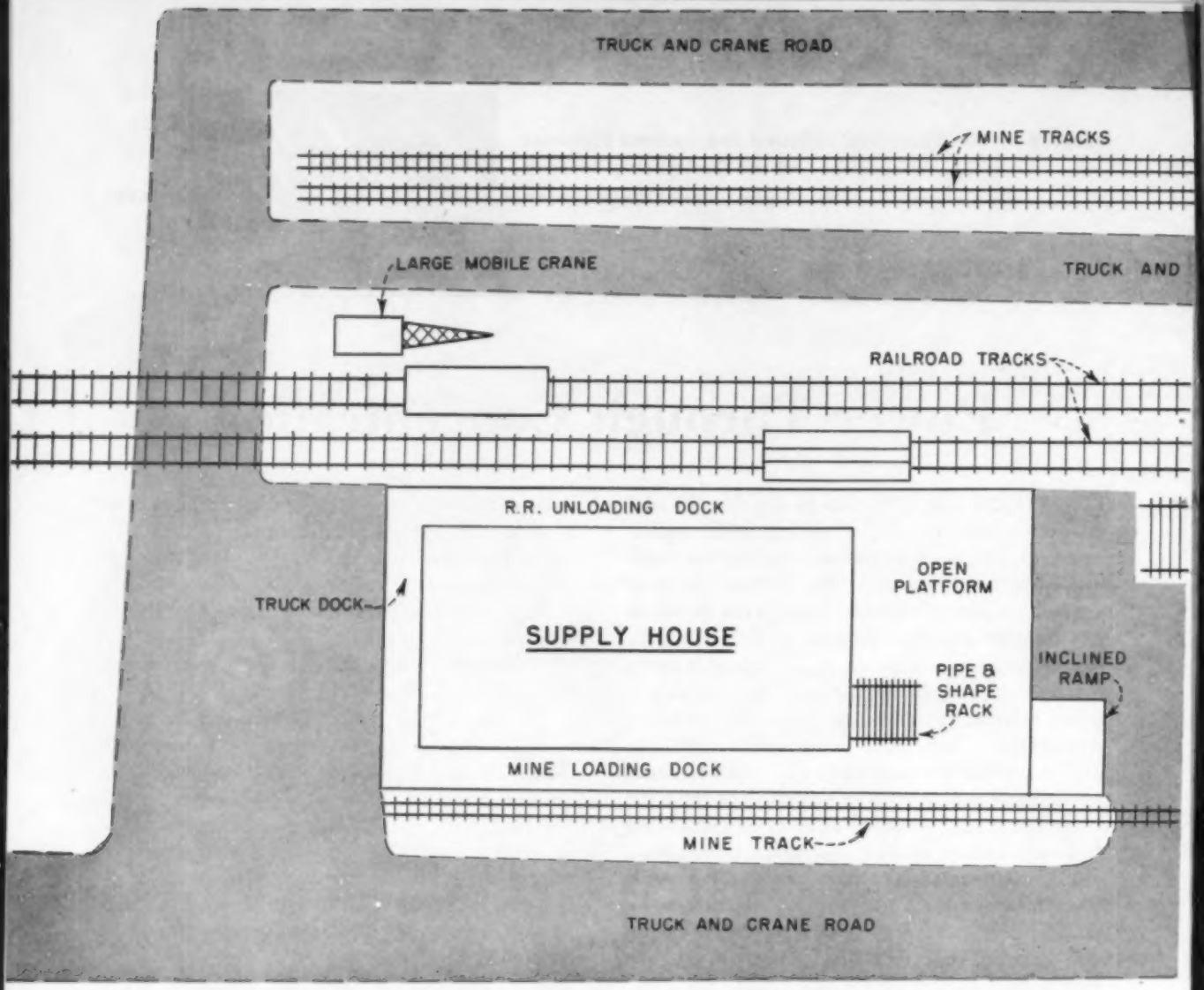
"7. Combining more productive capacity under single well-managed units.

"8. Better selling through larger units, including regional marketing agencies.

"9. Realization by utility and industrial executives that it is in the national and their own companies' interests to pay the cost of production plus a reasonable profit for the coal they buy."

Inherent in this program is concentration of power in solving industry problems—and in preventing the birth and growth of new ones, as, for example, subsidized atomic power generation, which has been seriously advocated and cannot yet be considered dead. Combination of more productive capacity into a single unit, reflected in the active consideration of new mergers, and combination of merchandising power in larger selling units, also a growing trend, are steps toward concentration of power and greater stability in industry operations, since both facilitate action by the industry as a whole—and with all the power that action as an industry represents—in advancing the interests of the industry from within, and in getting action from outside on problems it cannot solve itself.

Concentrated power makes it easier to convert weaknesses into strength—and to strengthen strength itself. Coal is strong in production and quality, and the road to additional strength is clearly marked. Coal is not so strong in research, in merchandising, and in the will and facilities for advancing its just interests in Congress, in government circles and with the public. Here, too, the steps that should be taken are clear, and the more industry organizes to bring massed power to bear, the easier it will be to take them effectively.



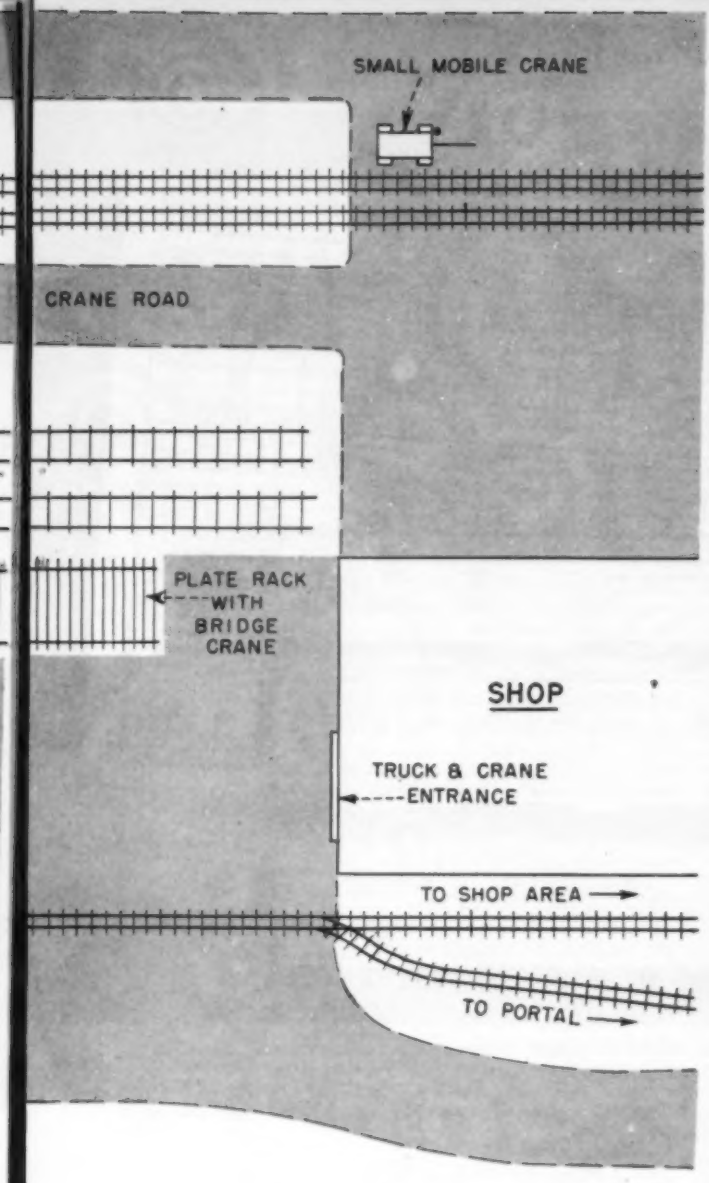
RECENTLY BUILT SUPPLY FACILITY features yard for easy access by trucks and mobile cranes, and a supply house with receiving and loading docks on three sides.

Cutting Supply Cost

COAL MINES spend an average of approximately 85c per ton for operating supplies and materials including repair parts. The low, usually at the smaller operations, is as little as 40c per ton or less and the high is over $1. Surveys by *Coal Age* indicate that the more-efficient operations tend to have supply costs at or above the average, reflecting the fact that keeping machines and men working requires an adequate flow of parts and materials. In other words, a good supply setup promotes efficiency and low cost in four major ways:

1. It enables machines and men to produce more by preventing interruptions resulting from lack of parts and materials—or delays in delivering them to the point of need.

2. It keeps investment in parts and materials to a minimum.



3. It prevents waste and loss of parts and materials.

4. It insures that parts and materials are received, stored and delivered to the point of use at minimum cost.

What is involved in a good supply setup and how to get it are the subjects of the material which follows in this *Coal Age* special cost-cutting report.

1. Inventory Control

PURPOSE: Keeping investment in parts and materials on hand to the minimum consonant with efficient mine operation.

Too high a supply inventory means letting money lie idle, while too low an inventory can mean production delays and higher production costs. Depending upon mine location and other factors discussed in the following, the level of supplies at individual mines ranges from as little as $25 to $30 per ton of daily capacity up to $150 or more per ton at mines remote from manufacturing and distributing centers. The average appears to be in the neighborhood of $50 to $60 on hand per ton of daily capacity.

Under coal-mining conditions, the inventory level involves a fair amount of personal judgment based on experience and an analysis of parts and supply use in relation to time for normal replenishment. Some of the factors involved in arriving at a solution include:

1. Cost of item or a class of items in relation to production cost increases incurred if the item is not on hand when needed—for example, spare armatures or motors. For instance, how much, at the most, would a rotor failure on the main shaker-screen motor involve in payments for nonproductive labor, for power for ventilation and pumping during the production interruption, and so on? And would the cost be reduced if a complete motor was on hand instead of only the rotor? Or should the possibility of a stator failure be the controlling one and thus dictate keeping a complete motor ready for replacement?

In all these, it is assumed that the tonnage loss could be made up at a later date and that the extra cost on the breakdown day is the major factor, though if the breakdown occurred near the end of the shift the loss might be reduced by better preparation in the mine for the following shift and consequently a higher tonnage and higher efficiency on that shift.

From the preceding, it can be concluded that there is no easy sure-fire formula for relating parts inventory to breakdown losses, though there is, of course, at least an approximate relation. Careful study of the problem is the best guide to informed judgment of what is needed.

2. Rate of use in relation to time required to reorder and get delivery of replacements. Experience normally will indicate the rate at which, say, controller fingers of a certain type are used. If new supplies could be secured in a month, then the maximum on hand at any one time theoretically would be a month. However, it may be considered desirable to have an additional reserve, which becomes largely a matter of judgment. Or, the total use in, say, 6 mo, might be so small that it would pay to keep that much stock on hand to avoid the extra clerical and other effort involved in ordering more frequently. Also, discounts for volume may be a factor in quantity ordered and consequently the total on hand at any one time.

3. Central warehousing v. warehouses at individual mines. Where one company operates several mines, it normally is considered more economical to operate one central warehouse provided certain conditions exist. These include:

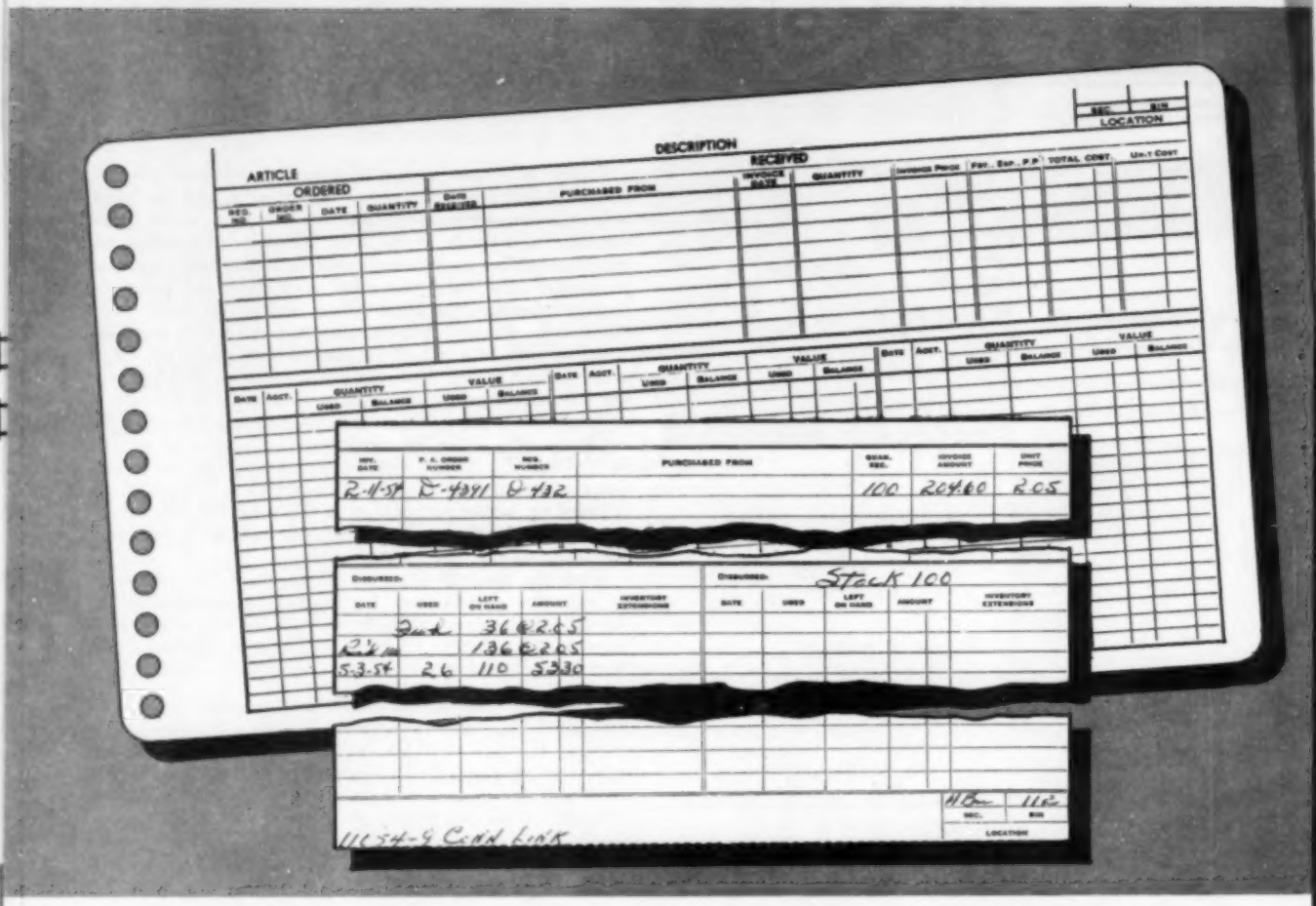
A. Reasonable distances from central warehouse to mines to keep down delivery time.

B. Good highways and good trucking facilities to permit fast deliveries.

Where these conditions exist, central warehousing, as noted, is considered feasible and economical, except for certain types of supplies, such as, timber, rail and the like. Of course, a certain volume of other parts and supplies must be kept at each mine and, in fact, at each deep-mine or pit face, to facilitate maintenance and prevent operating delays arising out of such things as lack of timber, etc.

A major advantage of the central system is reduction in total inventory because it is not necessary to duplicate each item at each mine, particularly the larger, more-costly units, since, with fast delivery, a smaller number of, say, armatures can serve the several mines. Otherwise, it might be considered necessary to keep one at each property.

Exceptions of course, include, as noted, timber, ties, roof bolts and other items used regularly and at relatively fixed rates which, once the rate of procurement and method are



PERPETUAL INVENTORY SYSTEM provides a running record of supply receipts, disbursements and costs. Cards shown are for loose-leaf ledgers (above) and tray-type files.

FLAGS on the bottoms of these perpetual-inventory cards, kept in tray-type files permit easy checking.

fixed, should be delivered directly to the mines to save rehandling.

4. Cooperative stocking. Where a part or a component is large, costly and requires considerable time to repair or, if completely wrecked, must be manufactured from scratch, it is possible for a group of companies in an area to buy one such component or part and rotate it around as needed. Thus, several companies—for example, a group of strippers using identical machines—are protected against major production losses with a minimum outlay for spare parts of a key and costly nature.

5. Independent warehousing. Where manufacturers, their agents and independent supply houses have branch or main establishments close to the coal fields, maintain stocks of the desired items and provide quick delivery, it is possible to use them as the source for many items, thus cutting down on both inventory and on company-owned warehousing facilities.

6. Price trends. If one is willing to risk the hazards of estimating future trends, it may turn out to be desirable to run up the inventory of parts and supplies—at least in part—to offset expected price increases, or to curtail purchases in anticipation of decreases. A more-rare occasion for perhaps increasing inventory is anticipation of decreased availability as a result of strikes, government control of critical materials, and so on.

2. Control Systems

PURPOSE: Accurate records of quantities on hand, quantities issued and dates of reorder.

While the plural "systems" is used in the title to this section, coal mines have largely settled on the "perpetual" system of inventory control. Basically, this system shows quantity and cost of units and materials received, quantity and cost of units and materials issued, and quantity remaining on hand at all times. From this, it gets its name "perpetual."

Two of the methods of keeping a perpetual inventory are:

1. Cards on each bin, particularly of the smaller items, on which the records of receipt, disbursement and quantity on hand are kept.

2. Cards designed for keeping in tray-type files, so-called rotary files, or in loose-leaf ledgers.

Wide use of the file-card system indicates that it is the handiest and surest. With bin cards or other systems, it normally is necessary to make an inspection or separate notes as the parts and materials are issued to determine if reordering is necessary, and those who have used the bin-card system report that there is a greater possibility of running short through failure to note that the time for reordering has come.

Inventory cards may be made up specifically by a mining company to meet its own needs, or cards, files and systems may be purchased from specialists in business machines and business records, who can, if desired, provide forms and equipment for even punch-card tabulating and record-making where the number and volume of supply items is large.

The accompanying illustrations show two types of cards provided by business-record specialists. One is designed for ledger use and the other for tray-type files. Both show purchases, including, in one type, cost of shipping, and both show cost and quantity received, cost and quantity issued and cost and quantity left on hand after each disbursement. The ledger form also includes a column for the account number to which the supplies are charged. Both also indicate warehouse section and bin number where the item can be found.

The perpetual system provides a running record of activity in supplies, and also an easy means of making periodic summaries of use. In some instances, certain types of supplies, such as, timber when bought locally as offered, may be excluded from the perpetual system. However, when there are exclusions, it becomes the responsibility of some supervisor or employee to make sure that (a) the items are not overbought, (b) that the quantity is not permitted to drop below the danger point, and (c) that data is supplied for the periodic supply-use and inventory reports. Most mines prefer to have everything in the system.

The records used in the perpetual systems also provide a convenient means of determining when reordering must be done. In other words, when the quantity left on hand after the last disbursement reaches a minimum shown by experience, a new order is placed. By the same token, the records may be used to prevent overbuying by establishing a top limit or quantity on hand, and also for maintaining an approximate average level between the minimum and maximum.

Certain types of cards are designed to permit the use of "flags," or colored tabs, to facilitate reordering and the compilation of periodic reports on use of parts, supplies and materials. A green plastic tab on the bottom of the card may be slid to the center the first time an item is issued in a monthly or other report period, and a red tab on the opposite side also may be slid to the center as an indication that the item is to be reordered when the next weekly requisitions on the purchasing department are prepared. The flags make it unnecessary to check each card for other preparation of the distribution report, or for reordering, thus saving considerable time and making it easier for the supply clerk.

Whatever the control system employed, it should be supplemented by an actual physical inventory. The practice varies between 6 mo and a year at most mines.

Even at small operations, an accurate record of receipts, cost and use is essential for wise and economical use of supplies, and while the perpetual or other good inventory system requires some paper work and the assumption of responsibility by some person, it can save both money and production time in the same proportion as in the larger operations.

3. Use Records

PURPOSE: Accurate determination of the cost of parts and supplies by functions or, in more detail, by machine and section, as a means of checking on loss, waste and destruction through carelessness, machine abuse, and so on.

Though it requires extra paper work, there is a growing tendency to go beyond the standard "supply-distribution report" and require more detailed reports on use of parts and materials by machine and by working section for the purposes listed in the preceding paragraph. The standard distribution report, usually prepared monthly, shows supplies charged to classes of equipment, such as, shuttle cars, and to mining functions, such as ventilation, timbering and the like. For convenience, each equipment class or mining function is provided with an account number.

Where account numbers are used, some hold that the daily or other delay reports (see "Maintenance for Lower Cost," July, 1954, *Coal Age*) provide—at least by inference—sufficient information to determine whether supplies are being used properly and economically. Those who are adopting the more-detailed system argue that definite and positive information is a necessity to prevent waste and loss through abuse and carelessness, particularly in view of the rising cost of everything that enters into mining.

Whatever the system, order forms, reports and records are essential for the proper evaluation of supply use. To start off with, nothing should be issued without an order, properly signed, stating what is wanted and where it is to be used. This applies even if the item is for current use, such as, timber, or is to go into, say, a section parts depot to replace some item used in maintenance. And for a check and appropriate action, summaries of supply use should be prepared at regular intervals for the information and use of mine and operating management.

The monthly distribution report previously referred to and prepared by account numbers is one form of report to mine and operating management. Where more detailed data are desired, the form or forms may be expanded to show items charged out to each machine, to each working section and to each general function, such as pumping, thus providing a better opportunity for determining whether abuse is running up parts cost for a particular loading machine, as an example, or whether certain sections are taking a larger-than-normal supply of timbers, perhaps indicating waste.

Aside from reports derived from the regular requisitions, special reports may be required of certain officials and mine employees. For example, a single carbide-tipped cutter bit can cost $1.25 or more, and, therefore, some opera-

ACCOUNT NO. LOADERS – 1–101

SHEET NO. _____

REPORT OF MATERIALS AND SUPPLIES USED AT _____ MINE FOR MONTH OF _____ 19____

DESCRIPTION OF MATERIAL AND SUPPLIES USED	QUANTITY USED	UNIT PRICE	SUB-ACCOUNT NUMBERS								
			LOADER #1	LOADER #2	LOADER #3	LOADER #4	LOADER #5	LOADER #6			
TOTAL											

MONTHLY USE REPORTS such as this lend themselves either to summaries by account or function numbers or by individual units. Here it provides a means of keeping track of parts costs by individual loading machines.

tors feel that it is in order to ask the section foreman or machineman to report daily on number on hand at the start of the shift, number received for replacement, number sent out for grinding, number destroyed in operation, and number on hand at the end of the shift. Similar records could be required for other small and relatively costly items, such as, roof bolts, steel ties and the like.

Since they are required to report on use, the men responsible naturally would take care to prevent loss, and if the record showed excessive destruction, for example, there would be an opportunity to check to find out why. Incidentally, such records also would reduce the number of small items, such as, cutter and drill bits, that would find their way into the railroad cars, particularly if the responsible men were required to turn in the worn-out or broken items.

To wrap up a detailed record system, it naturally should show transfer of certain materials, such as, steel ties from one working area to another, thus guarding against, among other things, possible loss through carelessness or buck-passing. And if such things as timber were salvaged for use elsewhere, the records should show how much came out of a particular section and where it went as a means of gaging, among other things, the effectiveness of a salvage program.

Naturally, records of this type are valuable only if the information derived is made available to the proper officials—hence the need for the distribution reports previously noted.

4. Allocation of Stocks

PURPOSE: Preventing production interruptions by providing stocks of parts and materials at or near the point of use.

Even where only one mine is involved, the satellite principle of stock allocation is necessary to keep production interruptions to a minimum. In other words, stocks of frequently used machine parts, as an example, should be kept close to or in the pit or underground section for the use of the section or pit electrician or mechanic. Otherwise, major delays may occur as a result of having to send outside or to the main supply house for a needed item.

Type of unit and experience indicate the types of parts and materials to be kept in such satellite pit or face depots. Normally, replacements for such stocks are charged to operating cost when they leave the main supply house. If it is desired, as discussed in Sec. 3, to keep accurate use records, the section or pit electrician or mechanic can file reports showing use of items by machine number, thus enabling operating management to keep track of where parts and materials go. Rather than a separate report, the section mechanic's or electrician's daily delay and repair report (July, 1954, *Coal Age*) can show what items are used and where.

Where two or more mines are involved and the central warehousing system is employed, allocation might be along the following lines:

1. Principal stock of repair parts at the central warehouse.
2. Subsidiary stocks at the central repair shop, provided it is not adjacent to the central warehouse.
3. Subsidiary stocks at the mine shops.
4. Section stocks in the working sections or pits for running repairs and maintenance.
5. Stocks of ties, timbers, roof bolts and similar items at the individual mines, since it is more convenient and less costly to have such materials delivered directly to the mines for storage and distribution rather than rehandling them from a central point. In fact, even where only one mine is involved, it may be more convenient to provide separate facilities for receiving, storing and distributing (a) machine parts and smaller items, and (b) larger, bulkier items used every day the mine runs.

There are, of course, many modifications of the preceding systems to suit individual conditions. The goal in all should be, however, providing adequate stocks at points of need whatever the system employed.

5. Storage and Handling

PURPOSE: Protection as necessary, and receipt, storing and issuance with a minimum of labor.

Type, size and cost of specific items normally dictates methods for receipt, storage and issuance. Thus, depending upon these factors, both enclosed and open storage are employed at mines. Enclosed or covered storage includes

MOBILE CRANE with various attachments handles heavy materials in the supply yard and can unload a carload of ties in less than 1½ hr.

REELS for cable, and the like facilitate handling

PUSH-TYPE LIFT TRUCK eases problem of handling heavy parts and units in supply house and shop. Similar mortorized units may be employed.

SPECIAL RACKS accommodate spare armatures and provide protection.

Convenient, Low-Cost Supply Handling

both regular supply buildings and also sheds for certain items requiring less protection.

Open or yard storage is satisfactory for timber, steel ties, rail and the like, including heavy equipment items that are not appreciably affected by rust and other deterioration as a result of exposure to rain, snow, dust and the like. Where the items are made, for example, from copper and lend themselves to theft, enclosed storage normally is dictated to prevent losses of this type. Shed storage may be desirable for pipe, structural shapes, plate and the like to prevent excessive rusting and also avoid difficulties with snow and rain in storing and handling. However, shed storage rules out, in most instances, the use of mobile cranes in handling such items, and the ability to use such equipment may outweight the disadvantages of open storage.

STORAGE LAYOUT

While the storage layout will vary from mine to mine, the plan shown in the accompanying illustration illustrates some of the basic principles involved in achieving efficiency, convenience and protection. In this instance, the shop is near the supply house and thus a separate shop supply is not required. The principles illustrated include:

1. Receiving and loading dock completely surrounding the warehouse. This is a practice that can be followed if desired, but it may not always be necessary to surround the supply house with docks, though provision should be made for sufficient dock space both for receiving and for loading to mine equipment. The docks in the setup illustrated are at the right height for receiving material from

OIL-HOUSE OPERATION is facilitated by equipment for easy handling of drums, such as these castor-mounted tilting racks.

railroad cars or trucks, and for loading materials into mine equipment without excessive lifting or lowering.

The design permits running hand trucks or other mobile equipment directly into cars or trucks in most instances for unloading, and also permits lowering items directly into mine equipment. It will be noted that for the most part items are taken into the supply house from one side and then move directly across to the mine track. If desired, the truck dock may be reduced to one-truck width, extended inside the supply house, and equipped with rollup doors so that loading and unloading can be done completely out of the weather. The railroad unloading and mine loading docks also may be roofed if desired, but here again a roof may prevent the use of mobile equipment for handling heavy items.

2. Open storage planned so that as heavy material is unloaded it can be placed so that it is convenient for loading into mine equipment. Roads are located so that mobile cranes can be used for unloading railroad cars or for lifting heavy items out of storage into mine equipment. These same roads permit unloading such items as mine props directly to the mine trucks if desired.

3. Use of power-operated handling equipment. The mobile crane, with various attachments, including clamshell for sand and gravel, and fork for props, rails and the like, or other mobile handling unit materially reduces labor and also the hazards involved in handling heavy parts and materials. With a fork-type grab, for example, two men can unload a car of ties in less than 1½ hr. Aside from cranes, mobile handling units include motorized wheelbarrows, motorized high-lift bucket-type loaders and carriers, high-lift fork trucks, crane trucks and so on.

Overhead Elimination—Added flexibility is achieved in the yard illustrated by the complete elimination of trolley wires—a growing trend in the design and operation of supply yards. Elimination of wires also eliminates a hazard, which still is present even if continuous guards are installed. Without trolley wires, material can be stored and reclaimed from either side of the mine track, and high-lift mobile cranes can handle materials across one or even two tracks without difficulty. Cars are handled in such yards by battery locomotives or, more commonly, by locomotives powered by gasoline or diesel engines.

4. Open platform with inclined ramp provides open storage for certain parts and materials and also makes it easier to get equipment, such as, shuttle cars, loaders and the like out of railroad equipment and down to mine-track level. Handling of heavy items on the platform can be done with the mobile cranes, or the platform can be equipped with crane rails and a hoist. An alternative is a crane track extending out of the supply house to the platform both for handling materials on the platform, or for moving them inside to floor storage. The plan illustrated also shows an open plate storage with traveling crane and hoist. Plates are stored on edge between stanchions.

As noted, there are many variations in layout to suit individual mine conditions. Among them are incorporating the supply house into a larger structure serving, for example, a truck garage and repair depot on one side, and a machine shop and general repair shop on the other. Or the supply house may parallel the shop with a track in front of the doors to the shop for loading parts and material into the mine equipment brought in, say, by a diesel or battery locomotive. Thus, most of the loading to mine equipment is under cover.

SUPPLY-HOUSE FACILITIES

Supply houses include both bin storage for small or moderate-sized items, and floor storage for heavier units. The floor-storage facilities at one new supply house include a basement for cool storage of rubber-covered cable, conveyor belts and other rubber items. Access to the basement is by 25-ton hydraulic lift, large enough to handle even the heaviest reels of cable and belt, which can be rolled on and off.

Some supply houses include a monorail and hoist for handling heavy units into and out of the floor-storage area, and storage facilities for such heavy items, include, in addition to open floor, racks for, say, spare armatures.

Other facilities which have proved successful in simplifying the handling of supplies in warehouses include: sectional steel bins with adjustable shelves; drawer-type and rotating bins for small items; clear plastic chest and drawer units for miniature units; shafts and reels mounted on walls or stanchions for convenience in paying out and measuring cable, hose, rope, etc., peg racks for V-belts and similar items; and platform-top push trucks for moving items to and from bins, especially if the warehouse occupies a rather large floor space.

If bins are built up higher than eyesight level or arm's reach, trolley or wheeled ladders or steps save time and reduce the possibility of injury. One wheeled step, for example, includes springs which give when a man puts his weight on the steps and thus provides solid footing while at the same time raising the unit when not in use to permit it to be wheeled about.

Light should be ample to read tags, nameplates and the like, and the sources should be placed so that it is relatively easy to see into the backs of shelves or bins, especially those high up.

In addition to provisions for hand trucks, some companies have found it desirable to provide aisles wide enough—at least in the areas where heavy units are stored—to permit small push-type mobile cranes or even motorized units to be brought in for moving, say, armatures to a neighboring shop or to cars or trucks for mine delivery. This presupposes floor construction strong enough to stand up under the traffic and also floors at ground or loading level, or ramps at convenient points, to permit mobile units to travel in and out from ground or other level.

6. Special Supply Houses

Supply facilities falling into what might be termed the special class are: powder and oil houses, sand-storage and drying establishments, and even portable or semi-portable pit or mine houses.

Design and location of powder houses is a matter of following the recommendations of state and federal safety authorities and the Institute of Makers of Explosives. Factors to be considered with other types include:

Oil Houses—There is good reason for putting oil houses and oil-storage facilities apart from other surface units. Oil and grease are, after all, flammable. However, there is no reason why they cannot be located for easy receipt of supplies either by truck or rail. As a matter of fact, convenient, clean and safe facilities for dispensing are as much factors in oil-house design as storage.

Designs most nearly meeting these objectives include: steel and concrete construction, racks that hold drums in proper position for dispensing, hoists or other mechanical facilities for handling drums, and provisions for catching drip and spillage. Fixed racks should be provided with inclined ramp rails to permit rolling drums up to position, unless chain hoists are used. Chain hoists, incidentally, make it easier to replace drums without handling of others, as do tilting-type racks with castors, which may be pulled out of position, run to the storage area and tilted to permit taking off the drum, after which the process is reversed to put a new drum into position.

Sand Houses—Terrain and other considerations affect sand-house design and location. If possible, the facilities should include storage for a specified number of truck loads. In hilly country, where sand is received by truck particularly, it may be possible to build the road up on the hillside so that trucks can dump directly to the bin.

The preceding comments presuppose gravity flow from the wet storage bin to the drying stove or stoves, and from the stoves or dry-sand bins to the locomotives, sand cars or borehole to the mine bottom. This gravity flow materially reduces labor in all phases of receiving, drying and dispensing sand, and this saving may warrant a substantial investment in bins and gravity-handling facilities which, in some instances, are almost or completely automatic.

Though not yet possible in too many mining areas, sand-handling facilities may be eliminated completely by depending upon outside suppliers for drying and delivery. At one operation, the custom drier delivers the sand in oil-type drums ready for movement into the mine.

Portable Supply Houses—Under certain circumstances, a "portable" supply house becomes quite convenient in addition to providing protection and promoting order in dispensing supplies—particularly machine parts. One circumstance is stripping where frequent moves are made from one location to another. Another is deep mining of the contour type, where the main opening keeps moving around the hill. Under such circumstances, a number of mining companies have bought small prefabricated buildings and mounted them on skids or trucks for towing from one location to another.

7. Supply Delivery

The motor truck in its regular form is the work horse in supply and delivery on the surface. In its special forms, especially at stripping operations, it includes grease trucks—usually designed for actual application of the grease at the point of use as well—fuel trucks and utility trucks. And at some operations, the final stage in storage and delivery of explosives—at strip mines, for example—is handled by small rubber-tired units designed for towing on the bank by tractor, relieving the regular truck for other duties.

For delivery between supply house and shop, for example, where the two are not too far apart and are connected by a hard-surfaced roadway, some deliveries may be handled by hand-pushed lift cranes, motorized cranes or special motorized flat-bed trucks.

UNDERGROUND DELIVERY

Where mine cars are employed to haul coal, the same track is used for delivery of supplies—perhaps to the face or, if trackless mining is the rule, to the point where the rails end. Even with belt haulage, convenience in handling supplies and men has led a number of operators to put supply tracks alongside the belt conveyor—or in a parallel heading. Battery locomotives may be employed for pulling the equipment on such auxiliary track systems to avoid having to put up trolley wire. And in some instances, rubber-tired tractors and trailers are employed to take in supplies, eliminating track completely. With either system, the added convenience and saving in time and labor is held to warrant the installation of the track or the preparation of the special roadway for the trackless battery units.

Where belts are installed for haulage, especially single panel units, they may be provided with reversing facilities for movement of supplies back to the face. In some instances, at least, special inching and jogging controls have been provided to facilitate handling long crossbars and other items without hazard to men or to the belt and conveyor.

Facilities for delivering supplies to the faces of rooms equipped with conveyors include:

1. Dolly trucks running in shaker lines.
2. False pan lines, or lines of pans alongside the operating line, which are loaded with supplies and pulled up as the main line is extended, the face pan going into the operating line and the supplies to other face operations. At the same time, a new pan is added at the outby end and loaded with supplies until the place is halfway up, at which point the loaded line will complete the place.

In pitching places, small hoists may be included in the equipment at the face to pull timber and other materials up from the track on the gangway below.

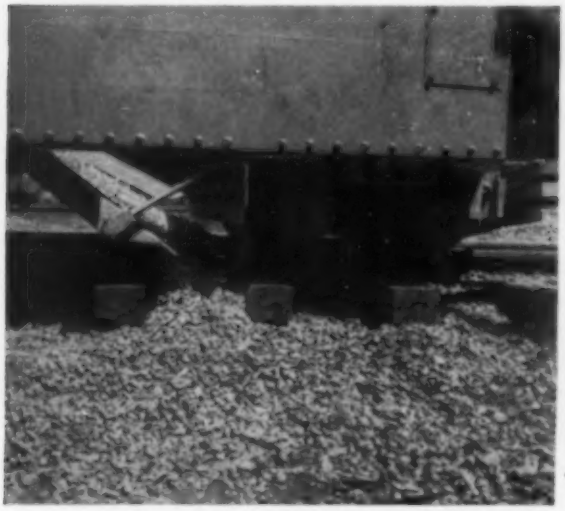
Mobile Units—For the most part, unless pitch or some other condition prohibits, the mobile unit operating either on or off the track is the most efficient and flexible unit for supply delivery. In trackless areas, the mobile unit may be a shuttle car, though using a shuttle car on the working shift may result in interference with production. If supplies are delivered on the off-shift, the shuttle car may well double in brass. And if crawler trucks are used for moving shortwalls, these same trucks may also be employed for handling heavy units, such as motors, drives and the like. Special crawler-mounted pullers and carriers also have been built for moving drives and for handling materials.

The extra advantages of special equipment, including availability at all times, design for handling materials and the like, have led, among other things, to a substantial growth in such equipment as battery-powered tractor-trailer units, especially in trackless areas. Some mines also have used the equivalent of a straight truck with a battery for power.

For rail delivery, the mine car, as noted, still is the mainstay. However, special cars and trucks provide a

STORAGE-IN-TRANSIT facilities include these rubber-tired explosives trucks at a stripping operation.

VERSATILE FLAT-BED TRUCKS facilitate supply delivery. Diesel locomotive is finding wider use in yard.



SPECIAL SUPPLY-HANDLING EQUIPMENT includes ballast car with doors for automatic spreading.

TRAILER PULLED BY BATTERY TRACTOR solves problem of supply delivery in trackless-mining sections.

Mechanizing Supplies for Low Cost

number of advantages, including better design for loading, unloading and protection of materials and supplies. An example is the low-height flat-bed car with steel deck and holes all around for stakes, which lends itself to handling almost any shape or size of material or part. Such cars are used on moderate-pitch slopes as well as on the flat. In tandem and properly loaded, such cars also can move rails and long timbers, though the special rail truck still is a standard item at most operations.

Other special cars which a number of operations have found advantageous include the following:

1. A utility car with a cab for the snapper equipped with plastic windows, and compartments for such items as steel ties, miscellaneous track and trolley supplies, coal augers, roof bolts and the like.

2. Sand cars especially designed for the service, including sides low enough for easy unloading to sand boxes.

3. Enclosed powder cars with sliding doors and insulated couplers.

4. Special insulated detonator cars with steel doors, wood and rubber lining, and compartmented drawers.

5. Special ballast cars with bottom doors designed for spreading ballast in the track.

Special handling facilities at unloading or transfer stations underground can materially speed up the job and reduce the hazards. Oil drums, for example, may be lifted off trucks or out of cars by a small chain hoist and run back into the underground depot on a monorail. Similar facilities also may be installed for handling timber, roof bolts and other bulky, lengthy or heavy materials and

SUPPLY TRANSFER UNDERGROUND is facilitated by hoist and monorail at one trackless operation.

parts. Handling is facilitated by bundling or tying the materials, such as, timbers, to make it easier to hook onto them with the hoist. In fact, some companies ask that lumber and certain other materials be bundled and strapped by the supplier to facilitate handling all along the line. Properly designed, underground stations of this type make it easy to unload and store materials until the face equipment is ready, then facilitate reloading for distribution.

8. Preventing Waste and Loss

There is no particularly easy road to reducing waste and loss in parts and materials, but results can be achieved by, among others, the following methods:

1. **Good Records**—Where supplies go and how much (see Sec. 3).

2. **Education.** Some companies have found, for example, that a display of certain supply items, each tagged with its cost and accompanied by some pertinent words by the superintendent or foreman, brings home to men the costs involved in loss or carelessness and consequently leads employees to handle materials and parts more carefully.

3. **Prevention of Machine Abuse.** This is largely a matter of training both operators and supervisors in how abuse results in breakdowns, lost time and an increased cost for parts.

4. **Rated Voltage.** Along with education of operators and supervisors, the rule should be rated voltage at the terminals of all machines, since less than rated voltage inevitably results in an increase in machine breakdowns, with attendant loss of time and increase in parts consumption.

5. **Protection.** Moisture in cement, coal dust in an open container of oil, and a bundle of roof bolts thrown along the rib and covered with loose coal are all examples of loss through failure to protect materials and supplies. The moral is enclosed storage for materials or parts subject to weather or water damage, enclosed containers for lubricants all along the line from receipt to point of use, and specific places for everything in the supply line—for example, special supply delivery points, with cabinets, chests and the like as necessary in every section for receiving and storing parts and materials. Indiscriminate dumping inevitably results in loss.

SALVAGE

The extent of salvage operations depends upon the value of the part or item in relation to the cost of getting it out and, if necessary, reconditioning it. Expending $2 of labor to recover something worth only $1 in the first place is, of course, out of the question. However, in view of the cost of materials and supplies these days, a carefully considered salvage program can result in major savings.

Education is a major ingredient in an effective salvage operation. In other words, if men are encouraged to form the habit of picking up anything they see lying around and turning it in to a specific salvage station—on each section, for example—rather than walking by or, even worse, pitching things into the gob without thinking, the company benefits not only by the return of usable parts and materials but also from the scrap value of worn out items. Of course, each foreman should make it one item of business to check on loose and misplaced materials constantly.

Certain items lend themselves to the use of organized salvage crews—for example, crossbar and post recovery. Equipped with mobile pulling units involving wire lines, chain slings and winches, such crews can, where safety considerations permit, recover several times their wages in posts and bars—as well as ties, rails and so on. A few mines have even used mine-detector-type equipment to find carbon-dioxide coal-breaking shells, steel ties and like buried in loose coal or gob in working places.

A new trend which shows signs of growing is the formation of special salvage organizations. As an example, one company appointed an experienced mine superintendent as head of salvage, provided him with facilities at a worked-out mine and gave him final authority as whether a piece of equipment or a part should be rebuilt or finally junked. It expects a substantial saving per ton over the hit-or-miss program previously in force.

Coal Age's Cost Cutting Series

With this article on supply costs, *Coal Age* concludes its current series of Special Reports on "Cost Cutting Today." Taken together, the 10 articles in the series offer a practical approach to lower operating costs through higher efficiency, by summarizing the basic underlying principles of modern coal mining practice and presenting specific examples of the application of those principles at actual mining properties.

Titles of the Cost Cutting Special Reports and their dates of appearance are:

***Cutting Cost—What's Needed . . . How to Do It*, January, 1953, p 70.**

***Efficiency—Machine Made*, May, 1953, p 86.**

***How to Use Modern Materials and Equipment*, July, 1953, p 66.**

***Cutting Cost in Stripping*, September, 1953, p 72.**

***Cost Cutting at the Face*, November, 1953, p 70.**

***Cost Cutting Behind the Face*, January, 1954, p 54.**

***How to Produce Quality Coal at Low Cost*, March, 1954, p 54.**

***Cutting Cost With Safety*, May, 1954, p 70.**

***Maintenance for Lower Cost*, July, 1954, p 50.**

***Cutting Supply Cost*, September, 1954, p 70.**

MAIN-ENTRY BELT at Peabody No. 10 travels 600 fpm, carrying 1,000 tph to 1,300-ton underground storage bin.

How Modern Methods, Effective

COAL CUTTING to a depth of 9 ft is assigned to universal units. A horizontal cut is made below parting.

TWIN-BOOM DRILL travels on self-propelled company-designed chassis. Three rows of holes are drilled per cut.

UTILITY TRUCK is used by fourth man of coal-breaking crew who services all air lines and performs other odd jobs.

HIGH-CAPACITY loaders and shuttle cars are key equipment in maintaining consistently high output.

SHUTTLE BELT receives coal from main-entry unit and moves back and forth on rails while filling bin.

Management, Creative Thinking Are Teamed to Mine 14,500 TPD

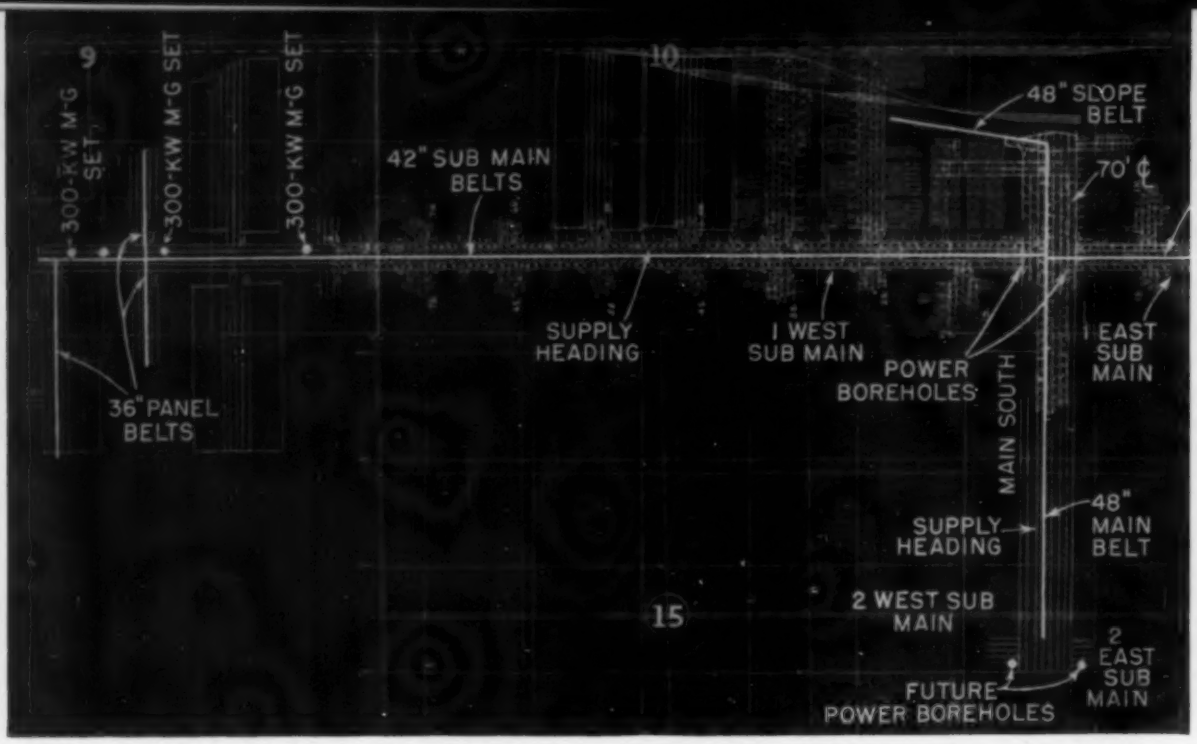
Highlights at Peabody's Newest Plant:

- Section crews average 800 to 900 tons per shift
- All-belt haulage handles 14,500 tpd in two shifts
- 1,300-ton underground bin smooths operation
- Stimulation of ideas improves methods
- Safety program makes employees safety conscious
- Flexible preparation geared to market opportunities

Typical successful ideas developed at Peabody No. 10 mine:

1. Metal stoppings save time
2. Crawler - mounted hoist moves equipment, recovers steel timbers
3. Rubber - mounted work bench easily moved
4. Converted elevator improves belt loading
5. Underground hoist handles palletized supplies
6. Steel doors easily installed

A complete description of these and eight other "Operating Ideas" begins on p 92. →



MINE MAP for 14,500-ton belt operation. South half of property will be completely mined by this system, with north half

How Peabody Coal Mines 14,500 TPD at New No. 10 Mine

By A. E. FLOWERS

Associate Editor, COAL AGE

NEWEST PLANT in a development and modernization program that began in 1947, Peabody Coal Co.'s No. 10 mine currently is producing 14,500 tons in a two-shift operation. In addition to installing all-belt haulage from the producing sections to the preparation plant, management has made an all-out effort to adopt equipment and methods designed to reduce human effort and up coal production. Results are reflected in a consistenly high section output, which averages between 800 and 900 tons per shift.

Another accomplishment of an alert and progressive management is the continuing, day-to-day emphasis on increasing the output of the modern machinery in use, and on stimulating the development of new production ideas and short-cuts by all company personnel. In its policy of actively encouraging continued progress, the company is seeking to capitalize even more on its initial achievements of planning a modern mine, with methods and equipment carefully keyed to a lower-cost, high-tonnage operation. Typical examples of management's success in developing ideas for improving work methods are included in the group of 14 "Operating Ideas" described on pp 92-96.

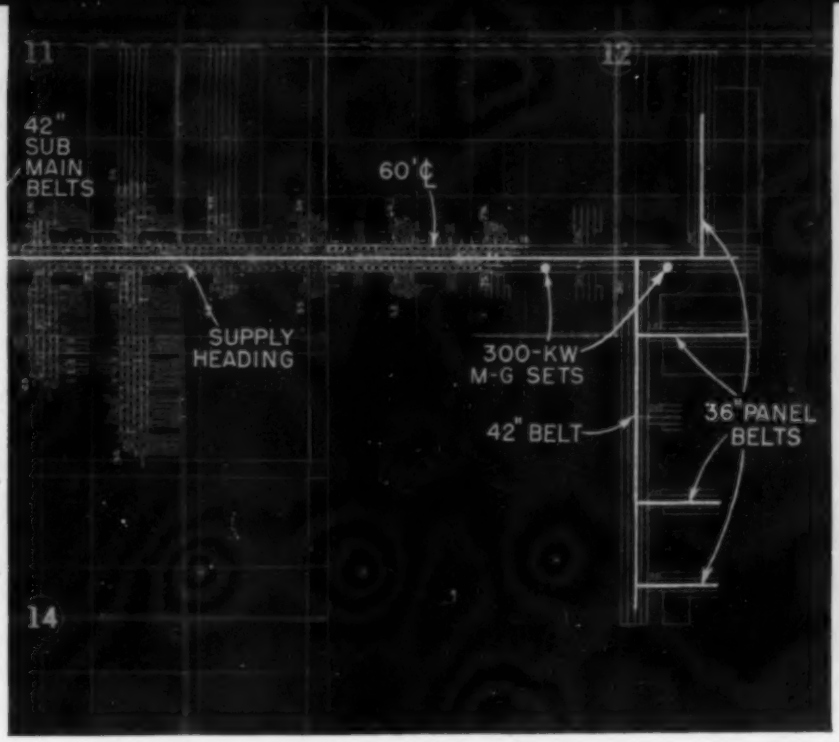
Stuyvesant Peabody, Jr., is chairman of the board and O. Gressens is president of Peabody Coal Co., with headquarters in Chicago. H. C. McCollum, vice president, operations, also headquarters in Chicago. Directly in charge of production, with headquarters at Taylorville, Ill., is J. Craggs, field superintendent. Assisting him in carrying out his duties are Keith McCann, assistant field superintendent; L. H. Johnson, safety engineer; F. R. Buckley, preparation engineer; G. L. Morris, field mining engineer; and Fred Becker, field electrician. John Carney is superintendent at No. 10. Other staff members at No. 10 include: Leo Gilmartin, first-shift mine manager; Coil Whitlow, second-shift mine manager; John Danko, first-shift chief electrician; Jack Haflinger, second-shift chief electrician; J. Brasche, third-shift chief electrician; J. Sharp, first-shift top foreman; Lawrence Stringer, second-shift top foreman; C. C. Calvert, chief clerk; and R. K. Edwards, chief storekeeper.

OPENING THE MINE

A 65-ft deposit of water-bearing sand, gravel and clay posed some unusual engineering problems in developing the No. 10 openings. Peabody was determined to use a slope with belt haulage for coal rather than a conventional shaft with a skip. However, ventilation was to be delivered through a 15-ft-diameter reinforced-concrete-lined shaft 350 ft deep. Peabody consulted the Dravo Co., Pittsburgh, who proposed a practical method that would permit the slope to be sunk through the soft ground at a satisfactory cost. As a result, a contract for sinking the air shaft and that portion of the slope which would pass through soft ground was awarded to Dravo. A detailed description of the contract work appeared in *Coal Age*, August, 1952, p. 97.

Shaft sinking began in January, 1951, and the coal was reached 4 mo later. In June, 1951, Peabody took over the completed shaft and installed a temporary hoist and skips in preparation for developing the mine toward a 26-in borehole. Located 300 ft west of the air shaft, the hole had been drilled prior to the sinking of the shaft and had been grouted and cased. A temporary blower fan was placed over the hole and a stacker cage was installed to provide an emergency escapeway so that more than 20 men could be worked during the underground development period.

While driving to the 26-in hole, three 6-man crews were used. On reaching the hole, crews were enlarged and development was rushed toward a projected area where rock removed in excavating for the 1,300-ton bin and from driving the slope



kept as solid reserve for future development.

could be gobbed. In addition to eliminating the need for hoisting rock, the coal removed from the proposed gob area helped pay for the rock work.

After the point of intersection with the slope was reached, rock development work was started upward in the slope to meet the surface development. A Joy 11-BU loader and a 10-SC shuttle car were used for handling rock in the first 40 ft of development. The loader was then replaced with a Joy 3-drum slusher which was mounted on the head of a loader head which also served as a surge bin. Shortly thereafter, track was laid behind the slusher and a 42D shuttle car was converted to a track unit by replacing the regular wheels with 12-in mine-car wheels. A 2-drum 75-hp hoist was used to handle the shuttle car on the 16-deg slope. The slusher was anchored in successive loading positions by four 2½-in steel pins driven into the bottom.

After the slope had been driven upward 75 ft, a 6-ft glory hole was driven to connect the slope and coal level to speed rock handling. Track was extended over the hole to permit the shuttle car to dump into the 18-ft-deep hole which served as a surge bin. Rock loading on the coal level was facilitated by a counterweighted gate that could be opened by a shuttle car as it moved under the hole. A Joy 11-BU loader and a track-mounted shuttle car were used in the downward rock development from the surface and to the bottom of the bin.

As the slope was advanced, 120-lb rails were set on 2-ft centers to support the roof. These were supported by 4x4-in oak timbers which rested on steel pins inserted in holes in the ribs. When the face advanced 100 ft, the rails were supported by center posts and permanent supports were installed. These consisted of 10-in H-beam stringers placed along each rib, and also 6 ft from the north rib, and supported on 8-ft centers by two 120-lb rails placed base to base. To keep the rails from digging into the bottom, a 1-ft-square piece of ½-in steel plate was placed under each pair of rails. To prevent the plate from slipping, two holes were drilled through each and 3 ft into the bottom. Steel pins were inserted in the holes and welded to the plates.

After the permanent supports were installed, an initial 2-in layer of sand-cement mixture was put on the roof and tie wires were placed in the soft material. After the first coat dried, 4x6-in-mesh reinforcing wire, 6-ft high, was attached to the ribs and a 3-in layer of sand-cement mixture was applied to roof and ribs.

Peabody's decision to use belt haulage at No. 10 for transporting coal from the producing areas to the preparation plant resulted from very successful previous experience with belts for intermediate haulage between shuttle cars and mine cars, and for slope haulage. While No. 10 was in the planning stage, management made a careful study of the practicability of all-belt haulage for a 14,500-ton mine. Comparative cost estimates were made for installing, maintaining and depreciating various haulage systems that incorporated belt conveyors in various degrees. Although the all-belt system required a higher capital investment, management felt that the advantages of such a system far outweighed the disadvantage of the initial investment.

Six reasons pointed out by Peabody for selecting the all-belt system are:

1. Higher output because of uninterrupted haulage.
2. Fewer accidents compared to track haulage.
3. Less manpower to produce the tonnage desired.
4. Less deadwork for grading, timbering and roof brushing than with high-speed track haulage.
5. More efficient handling of men and supplies because of an independent haulage system.
6. Greater concentration of mining with resulting greater efficiency and economy.

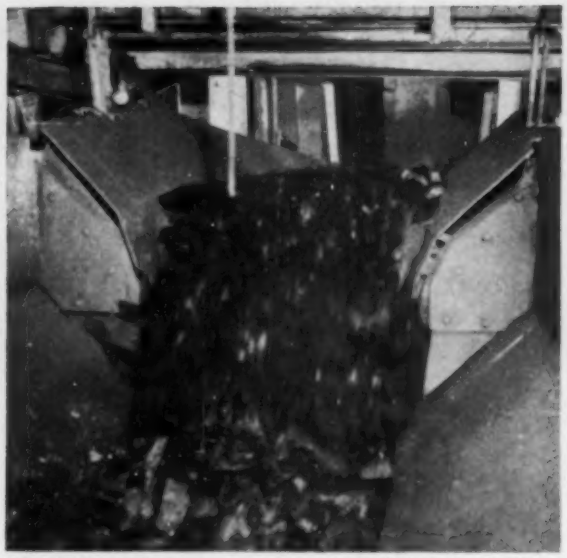
MINING CONDITIONS

Mining is in the Illinois No. 6 seam which lies 350 ft below the surface and averages 7½ ft thick. Overlying the coal is a 1- to 6-in layer of friable shale locally called clod. Above the clod is either limestone or a 3- to 6-ft layer of shale which forms the normal mine roof. The seam is underlain by fireclay. In some areas, the roof shale is covered by a water-bearing sandstone and in others by limestone. Roof-bolting is practiced where the limestone overlies the shale but is not practicable where the water-bearing sandstone is present. Where limestone is immediately over the coal, only straight posts are needed. A thin band of rock, about 24 in above the floor, is present in the coal throughout the mine.

HOW THE MINE IS LAID OUT

The main slope and air shaft are approximately in the middle of a 5x8-mi rectangular block of coal with its major axis running north and south. After laying out the mine projections, Peabody management decided to develop main entries initially in a southerly direction only from the main openings. Thus the property would be divided into an active developing and producing area in the south and a solid reserve territory in the north for future development. By adopting this plan, management felt that mining would be concentrated better and maximum efficiency could be obtained from the belt conveyors. Further, management saw that by concentrating mining in one area, future installations of man portals and air

ROOM-PANEL BELT handles output from two production units. Turning chute loads sub-main belt parallel to travel.



SPEEDUP BELT under bin was included in haulage system to reduce damage to slope belt at the loading point.

END LOADING on panel belts centers coal and prevents spillage that results from off-center loading.

BELT REPAIR is handled in section of surface shop where factory-type vulcanizing job is done.

shafts would be much easier to plan.

In accordance with the original plan, eight 14-ft headings on 70-ft centers were driven south 1,100 ft. At this point, sub-main entries were turned east and west with five headings on 60-ft centers. These were rushed to their projected limits of 8,000 ft to the east and 9,200 ft to the west to permit room entries delivering coal to the inby belt to be mined as quickly as possible. This will permit recovery of a complete belt conveyor for development of the second set of sub mains. These new sub mains recently have been necked by the main-entry crew which has continued to drive the main headings.

Room panels are developed north and south off the sub mains to a depth of approximately 1,800 ft with five headings on 60-ft centers. Standard practice is to advance the headings to where Room 15 is projected to be turned and then add a second production unit to start mining rooms. Starting on the return-air side of the panel, the second unit mines rooms in groups of six. Rooms are 26 to 30 ft wide and are driven 300 ft deep. Between each group of rooms, a solid block of coal 70 ft thick is left to provide additional roof support. When the development crew reaches the entry limit, it starts mining rooms on the opposite side of the entry until new entry development is needed. This method of mining permits rapid extraction and mine roof does not have time to deteriorate. A set of six rooms is mined out in 7 work days.

ALL-BELT HAULAGE

Twenty belts ranging from 36 to 60 in in width, and up to 5,000 ft in

MAIN-SLOPE BELT is designed to handle 1,000 tph on a 16-deg slope.

length, are linked together in the No. 10 coal-haulage system. Ten 36-in Jeffrey units powered by 50-hp 250-v DC General Electric motors are available for handling the coal in the room panels. One of these units, traveling 400 fpm, can carry the output from two loading units. Panel belts are extended to a maximum of 1,800 ft.

The room-panel belts discharge onto 42-in Joy conveyors in the east and west sub mains. In the east are 3,000- and 5,000-ft conveyors, and in the west are 3,000-, 4,000- and 2,500-ft units. All are tandem drives, powered by 150-hp 4,160-v AC Allis-Chalmers motors. Intermediate sections are 8 ft long and are knock-down type specially designed for Peabody. They are reported to be the first knock-down sections made in such large units.

East and west sub mains are offset 25 ft to permit smooth transfer of coal to the 48-in Joy belt in the main entry. Both sub-main belts discharge onto a 50-ft 48-in Joy transfer belt which in turn delivers the combined load to the main 48-in belt. The transfer belt absorbs the impact from the falling coal and permits the coal to come to rest before it is transferred to the main belt. The transfer unit is powered by a 20-hp 440-v Allis-Chalmers motor.

To change the direction of flow of the 42-in units and load the speedup belt parallel to the direction of travel, turning chutes are fitted to the ends of the sub-main belts. A bar screen is built into the lower end of the chutes to permit the fines to pass through to the transfer belt first and cushion the lumps as they are loaded.

The first 48-in main-entry belt is 1,100 ft long, travels 600 fpm, and is driven by a 150-hp 2,300-v AC Allis-Chalmers motor. The second main-entry conveyor is 3,700 ft long and is driven by two 150-hp 2,300-v Allis-Chalmers motors.

Coal from the main-south belt is distributed into a 1,300-ton concrete bin by a track-mounted 60-in shuttle belt powered by a 25-hp 440-v Allis-Chalmers motor. This 90-ft conveyor is moved back and forth over the bin from a central control panel located near the center of the bin. One man operates the shuttle belt and starts the underground system from this control center.

The 1,300-ton hopper provides surge capacity between the underground belt system and the preparation plant and permits either to operate independently of the other.

Two Syntron vibrators transfer coal from the bin to a 48-in Joy Speedup belt which discharges onto the main 48-in Joy slope conveyor. The 50-ft speedup unit is driven by a 40-hp 440-v Allis-Chalmers motor. Rate of feed to the speedup conveyor is controlled from the preparation plant. Although the speedup belt is not necessary in the belt system, it was installed to reduce damage to the main-slope conveyor at the loading point. To further protect the slope belt, pneumatic impact idlers were installed at the loading point.

The main slope belt is designed to carry 1,200 tph of coal up a 16-deg slope for a distance of 1,729 ft, with a vertical lift of 475 ft. To handle this assignment, it is equipped with a modified dual-tandem drive operated through Jones speed reducers powered by three 2,300-v 250-hp Allis-Chalmers motors. The coal carrying job in the slope is handled by a Goodyear steel-cable belt.

A nylon-cord emergency-stop line is installed along the belt to permit stopping or starting from any point along the line. The belt also has a fire-protection line with fuse links at regular intervals. If heat should melt one of the links, the belt would stop and could not be started until the link had been repaired.

INSTALLING THE BELTS

Realizing that flow of coal to the preparation plant depends upon how well the belt conveyors do their jobs, Peabody places special emphasis on proper installation and operation. Particular care is taken in installing the main and sub main units.

The first step in installing a sub main or main belt is to establish a sight line for the drive and conveyor line. Next, excavations are made for concrete foundations for the drive and tail pulley. Included in these foundations are H beams to which the drive and tail pulley are securely attached after they have been aligned properly. While the foundations are being prepared, conveyor parts are distributed along the heading for speedy assembly after the drive and tail pulley are in position.

A typical belt installation with 1,500 ft of conveyor and belt requires the following labor:

Drilling and shooting for drive and tail pulley, 8 man-shifts.

Loading rock from shot area, 4 man-shifts.

Building forms and pouring foundations, 16 man-shifts.

Making electrical connections, 5 man-shifts.

Setting drive and 1,500 ft of conveyor, 129 man-shifts.

To keep shuttle-car haulage distance as short as possible, the 36-in panel belts are extended to as near the face as possible. Conveyor extensions are made on the third shift by a 6-man crew that can make a 150-ft extension in 6 hr. A 6-man crew sets all 42-in drives on the first shift.

Evidence of the thorough job of installation is the fact that all 42- and 48-in belts operate without training idlers, and it has never been necessary to clean up spillage along the main belt since it was installed.

CONTROLLING THE BELTS

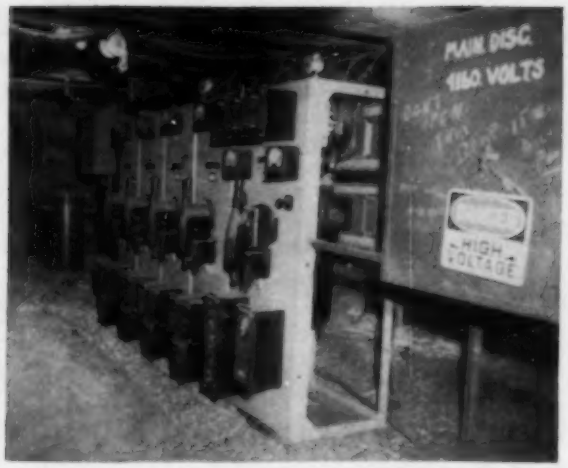
All belts are interlocked and starting is in sequence through a system of centrifugal switches. Controls are designed to permit belts to be operated in sequence, out of sequence for maintenance or inspection, or locked out.

Belt controllers are provided with fuse short-circuit protection, thermal overload protection and acceleration control. Protection against belt slippage is provided by a control operated by a centrifugal switch that cuts off the power if the belt does not come up to full speed within a predetermined time interval.

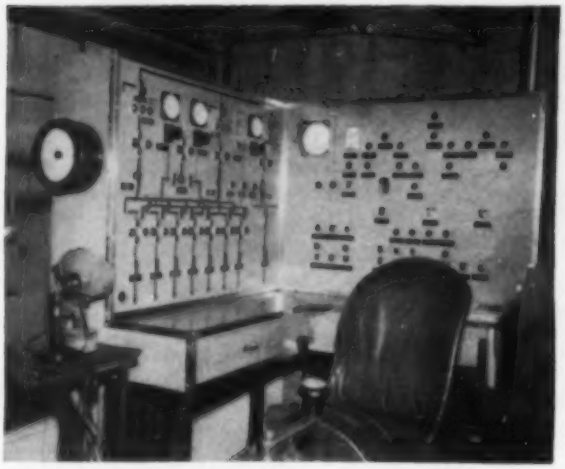
To permit emergency stopping of belts, an emergency-stop circuit is installed along the rib parallel to the belt. The safety line is made up of 250-ft sections of No. 14 rubber-covered Tirex cable with 2-conductor Miller plugs vulcanized on each end. To stop a conveyor, the line is disconnected at one of the plugs and cannot be restarted until the plugs have been rejoined. There are no switches in the line.

Other protective devices include

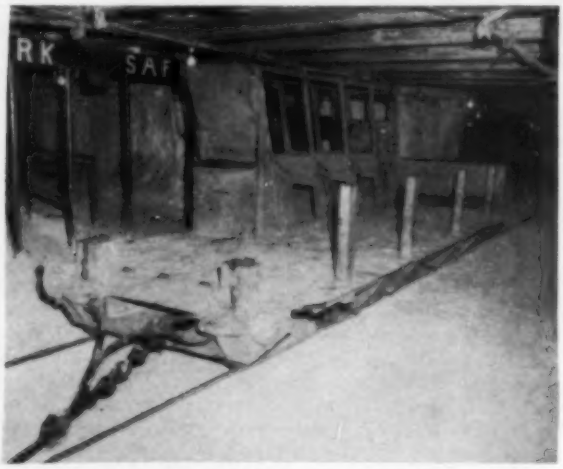
INCOMING POWER at 34,000 v is stepped down for company needs by these three sets of primary transformers.



PROTECTION of high-voltage circuits to underground substations and belt drives is provided by these units.



CENTRAL PANEL BOARD in hoist house permits hoist man to disconnect all power by pushing two buttons.



PILOT CAR with automatic magnetic track-shoe brakes leads man-trip cars down slope. Unit also has radio phone.

PEABODY OFFICIALS include: L. H. "Hap" Johnson, safety engineer; J. Craggs, field superintendent; Frank White, former vice president, operations; John Carney, superintendent; and Leo Gilmartin, mine manager.

PROTECTIVE SWITCH in 4,160-v line permits isolation of one part of mine if necessary.

paddle switches to prevent coal pile up at discharge or transfer points and limit switches to prevent belt pile up if a belt should break.

In addition to electrical and mechanical protection, fire protection is provided for all belts. Along each conveyor is a 2-in fire line with valves and 100 ft of hose at 200-ft intervals. All hoses are equipped with fog nozzles and water pressure is maintained at 150 psi. An Ansul 20B fire extinguisher is kept at each belt drive, and bags of rock dust are stored at regular intervals along the conveyors.

SUPPLY HANDLING

Since haulage distances at Peabody No. 10 eventually will extend several miles, supplies and materials are handled over an independent track system. Flexibility possible with off-track supply equipment is sacrificed for greater speed in getting the men to and from the work areas. Keeping travel time to a minimum will become increasingly important as the mining moves farther away from the slope bottom.

An Allis-Chalmers hoist equipped with a 1⅛-in 6x19 Macwhyte rope lowers men to the slope bottom in two specially designed Sanford-Day man-trip cars with a combined capacity of 80 men. Coupled to the cars and leading them down the slope is a control car permanently attached to the hoist rope. The control car has five seats and space for carrying small tools or supplies. It also is equipped with an MRS radio permitting communication between the hoist engineer or the man stationed at the bottom of the slope. Protection against overspeed is provided by an automatic magnetic-shoe track brake which also may be operated manually from the car. There are six shoes, normally supported on springs and held ⅜ in above the rail. When the solenoids are energized the shoes are forced to the rail. Energy for the brake is supplied by a 32-v battery.

At the slope bottom, men are transferred to all-steel man-trip cars with insulated roofs and automatic couplings. Men and supply trips are handled by Goodman 8-ton trolley locomotives. All supplies are distributed by a 4-man crew, which also is responsible for man-trips.

As far as practicable, supplies are packaged on pallets or in bundles that can be handled with a minimum of effort and time. Flat-bed supply cars with removable stakes are loaded on the surface and are directed to their destination by the bottom man.

Supply tracks terminate immediately inby the mouths of room entries where supplies are transferred to battery-powered shuttle cars for distribution in the work area. To transfer pallets to shuttle cars, a 1-ton Yale electric hoist mounted on a monorail bolted to the roof is installed at each transfer point. Supplies are distributed in the working area as requested by the foreman on his daily order slip.

HOW THE COAL IS MINED

The production assignment at No. 10 is handled by eight face units operating two shifts per day. Each section is equipped with a Joy 11-BU loader, 10-RU cutter, two 10-SC shuttle cars, two twin-boomed Dooley 580 drills mounted on company-designed frames, and a company-designed utility truck. The coal drill also is used to drill holes for roof bolts. Where roof bolting cannot be practiced, company-designed timber setters are assigned to the section. Recently, a self-propelled rubber-mounted twin-boom chain-feed Joy CD42 hydraulic drill equipped with a 9-ft auger was installed in one section to permit a blasthole to be drilled without stopping to add an auger section. Drills are equipped with Coalmaster and Dooley 2¾-in augers and Vascoloy-Ramet carbide bits.

Coal is cut horizontally to a depth of 9 ft about 15 in above the floor and immediately below the rock parting. Cutting machines are equipped with Prox chains and bits, and 1/0 cables. As many as 40 places are cut per shift in 14-ft headings, and 25 in 26- to 30-ft rooms. To allay dust during the cutting cycle, each machine is equipped with a Gorman-Rupp centrifugal pump which delivers 10 gpm at 60 psi to the sprays on cutter bars. Eleven holes are drilled in 14-ft headings and 16 are drilled in 26- to 30-ft rooms. Coal is broken on shift with Airdox at 10,000 psi. Three men handle the coal-breaking job and a fourth man, equipped with a 3-wheeled battery-powered truck, extends and services the Airdox lines. Two air lines are installed in each working place to speed coal breaking.

Output from loading units has been consistently high, averaging between 800 and 900 tons per shift. Management emphasizes that excellent cooperation from all employees has played a large part in maintaining this consistently high output.

Section personnel is as follows: 1 section foreman; 1 belt-cleanup man; 2 timbermen; 1 repairman; 1 wireman; 1 Airdox man; 3 shooters; 1 brattice man; 1 clod man; 2 cutting-machine men; 2 loading-machine men; 2 shuttle-car operators; 4 drillers; a total of 22.

ROOF CONTROL

Because of the variation in the character of the roof, support methods are selected to best suit local conditions. The soft clod over the coal always is taken down before roof support of any type is installed. Where the coal is overlain with shale, which is under limestone, 4-, 5- and 6-ft West Virginia Steel expansion-type ¾-in roof bolts are installed on 4-ft centers. Expansion shells are supplied by the Ohio Brass Co. and bearing plates are purchased from various steel manufacturers as a by-product and at considerable savings. A 2x12x18-in oak header is installed with each roof bolt. Regular tests are made with a torque wrench to assure that bolts are being tightened properly and frequent tests are made with a pulling device to determine how well bolts are holding.

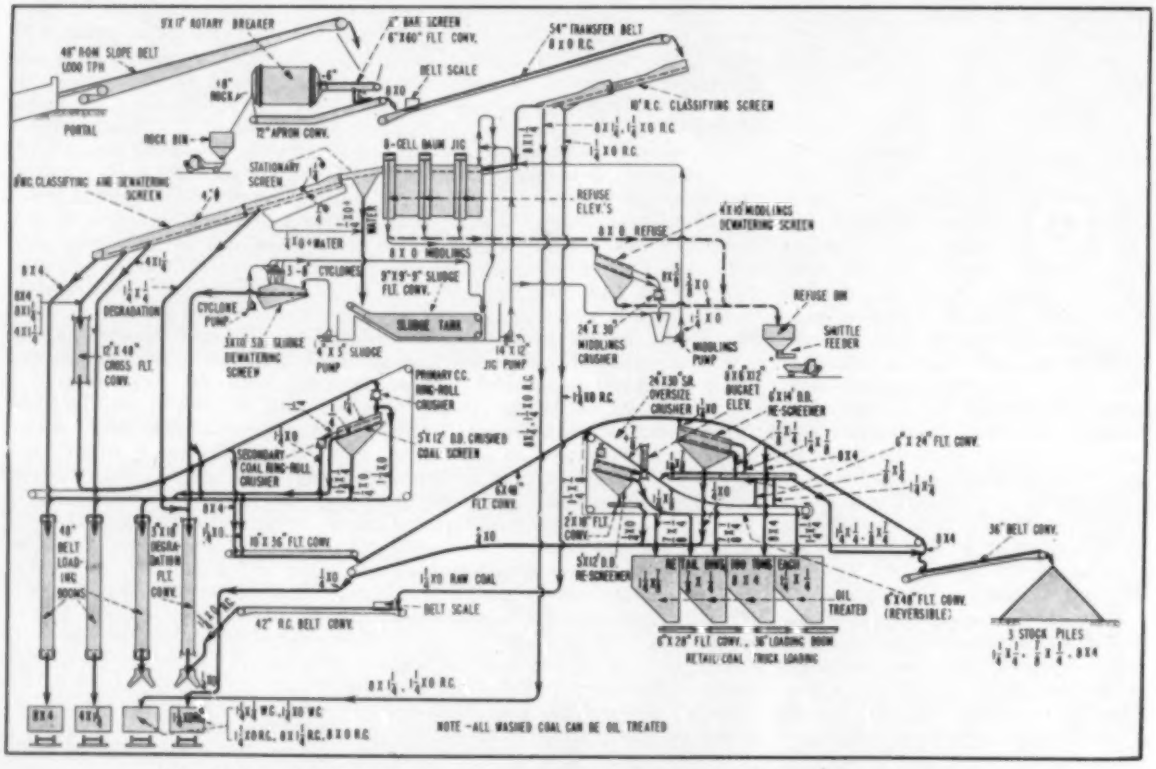
Where the immediate shale roof is covered by a water-bearing sandstone, roof-bolting is not practicable. In these areas, steel rails are set on 5-ft centers with straight posts for support. If the clod is overlain with limestone, straight posts usually are sufficient to hold the roof.

A special recovery crew, consisting of three men and a foreman, recover steel rails and roof bolts from mined-out areas. These men are experts in their jobs and recover enough material to more than pay their wages. When these men are recovering rails, they use a crawler-mounted hoist and shuttle car to reduce human effort to a minimum. Rails are pulled with aid of a wire rope and when three or four are on the mine floor, they are tied together with the hoist rope and pulled into the shuttle car. To make the loading operation as simple as possible, the hoist rope is passed over the shuttle car, which is positioned between the hoist and the rails, and is looped around the group of rails. As the rails are pulled toward the hoist, they are lifted into the shuttle car with little or no help from the men. Recovered rails are hauled to one of the electric hoists and transferred to a supply car for delivery to an active section.

MAINTENANCE

Continuous rebuilding is the foundation of No. 10 maintenance. A loader, cutter and shuttle car are in the shop for rebuilding at all times. Shop maintenance is handled by nine men on the day shift and six on the second shift. In addition to conventional shop equipment, there is a belt-repair area where belts up to 48-in wide can be repaired and vulcanized. Two men on the first and third shifts

PREPARATION PLANT has 1,000-tph capacity and features jig washing of 8x1¼, oil treating and facilities to permit coal to be loaded into railroad cars, delivered to storage bins or stockpiled.



HOW COAL IS PROCESSED in the modern, flexible cleaning plant at Peabody No. 10.

are assigned to belt maintenance. The third-shift crew repairs any cleaning-plant belts which cannot be fixed while the plant is running.

Underground maintenance is carried out 24 hr per day. On each of the two production shifts one repairman is assigned to each loading unit to handle day-to-day repairs. In addition, three men are stationed at the intersection of the main and sub-main belts. On the first shift these men check all belt controls and substations, after which they are available for spot assignments. On the second shift they are assigned to work on face equipment as needed. One repairman and one greaser are assigned to each section on the third shift.

A system of rigid inspection and effective belt maintenance has paid off

at Peabody. Management reports that as a result of the program they never have had a piece of belt wear out in the Taylorville division.

Here's how the system works. As an entry retreats, all sections of belt are inspected as they are recovered and wound on spools, and are marked for reuse or repair. Rolls marked for reuse are stored at a central location while those needing repairs are taken to the surface for vulcanizing. At the belt-repair center, each section of belt is examined thoroughly on a work table and damaged places are prepared for vulcanizing. If the fabric is damaged, it is replaced before new rubber is added. Cold neoprene sometimes is used to repair small cuts and minor damage to the belt edge. Each piece of belt is numbered and an accurate record is kept of the maintenance cost of each. Before underground belts are joined with Flexco splices, the ends of the belt are sealed with liquid neoprene to prevent moisture from attacking the fabric.

POWER

Power is delivered to the mine site by the Central Illinois Public Service Co. at 34,000 v, and is stepped down to 2,300 v by two banks of 1,500-kva Allis-Chalmers transformers, and to 12,000 v by a 3,000-kva unit. The 2,300-v circuit serves the preparation plant, hoist, slope belt, Airdox compressor station underground, mother belt and shop. The circuits are laid out so that any one unit can be operated separately. A 12,000-v line leads to two 1,500-kva transformers where it is further reduced to 4,160 v for transmission to the mine substations and belt drives through boreholes.

All surface power lines leading from the main transformer station are Okonite neoprene-covered cables and are buried in the ground in Transite pipe. Power is carried underground by two 250,000-cir mil Simplex and Hazard Type SHD cables.

The transformers at the top of the boreholes have delta primary and wye secondary with neutral grounded through a limiting resistance. If a ground occurs, the limiting resistance permits a maximum of 200 amp to flow and a General Electric IAC relay operates to break the circuit after 1½ sec.

After power enters the mine, it flows through 300-amp General Electric disconnect switches and a series of five IAC relays before reaching the belt drives and m-g sets. The first relay inby the disconnects is set at 1 sec and the remainder are set at ½ sec.

To insure continuous power for conveyors and mining equipment, two 4,160-v 350,000-cir mil cables are carried to the m-g sets. These are installed in the supply heading in 1,000-ft lengths and are connected with G. & W. Specialty Co. junction boxes. By using a 500-ft length as the first section of one of the cables, junction boxes are staggered at 500-ft intervals, and thus substations can be moved up without additional junction boxes. A G. & W. load-break switch, set at 300 amp, is installed approximately at the midpoint of each cable to permit operation of part of the mine if trouble should develop inby the breaker.

Seven General Electric 300-kw skid-mounted m-g sets provide 270-v DC power for the face equipment. These units have automatic time-clock controls that disconnect the stations at the end of the second shift and restart them at the beginning of the first shift. Timing devices can be set a week ahead if desired.

A 1,000,000-cir mil DC circuit leads to the mouth of each room panel where it is divided into two 500,000-cir mil circuits carried forward in separate headings adjacent to the belt heading. A tie line at every seventh room connects the two circuits to permit operation of the equipment in event of trouble in a section served by one of the branches. Facilities are provided to isolate east, west and south sections without interfering with the others.

SAFETY STRESSED

"If it's not the safe way, it's not the right way." That's how L. H. "Hap" Johnson, safety engineer, summed up Peabody's philosophy toward safety. To keep all employees safety conscious, Peabody carries out a continuous program that includes meetings, safety training and adequate supplies and equipment. The company is an active member of the National Safety Council and displays all posters in prominent places to remind men to work safely.

Daily, weekly and monthly safety meetings are held to maintain interest at a high level. Mine management has daily safety meetings with mine foremen at the beginning of each work shift. These last about 20 min, during which time re vent accidents and hazards are discussed and methods of preventing them are developed.

On the first work day of each week, every section foreman holds a 5- to 15-min meeting in his section to discuss the hazards there and to alert his men to the hazards discussed in the daily foremen's meeting. Crew members are encouraged to participate in these meetings and they usually do. Additional meetings are held as needed.

Once each month all supervisory personnel meet with the field superintendent at the mine office to discuss safety problems.

Firm believers that training improves safety and increases efficiency, Peabody currently is carrying out a program aimed at 100% training in the U. S. Bureau of Mines accident-prevention course, which is carried out with co-operation of representatives of the Illinois Department of Mines & Minerals. Representatives of the two organizations and Peabody participate at all meetings. All foremen already have been trained in the U. S. Bureau of Mines 40-hr safety course for supervisors. Largely as a result of the intensive training program, there has been a marked improvement in Peabody's safety record. The accident frequency rate has been reduced 13.3% and the severity rate has been slashed 50.0%.

All foremen and miners have been trained in first aid and there is a first-aid team at each mine. To keep interest in first aid at a high level, a team is entered in the national first-aid contest each year. In addition to the first-aid work, Peabody keeps 60 men trained in mine rescue and recovery work. Adequate first-aid supplies are kept at all foreman stations, and a supply of self-rescuers and all-service gas masks are located in each sub-main entry.

Fire-fighting equipment has been installed throughout the mine to handle any emergency that might arise. A 2-in water fire line with valves and 100 ft of hose at 200-ft intervals is installed along each belt. Water pressure is maintained at 150 psi and all hoses are equipped with fog nozzles. All cutting machines are equipped with Ansul dry-chemical fire extinguishers, and at each belt head, m-g set and foreman's station there is an Ansul 20B extinguisher. Shuttle cars and supply locomotives carry two 50-lb bags of rock dust at all times and a supply of rock dust is kept at all doors, m-g sets and at regular intervals along all belts. A reserve supply of 20 bags is stored at each foreman's station.

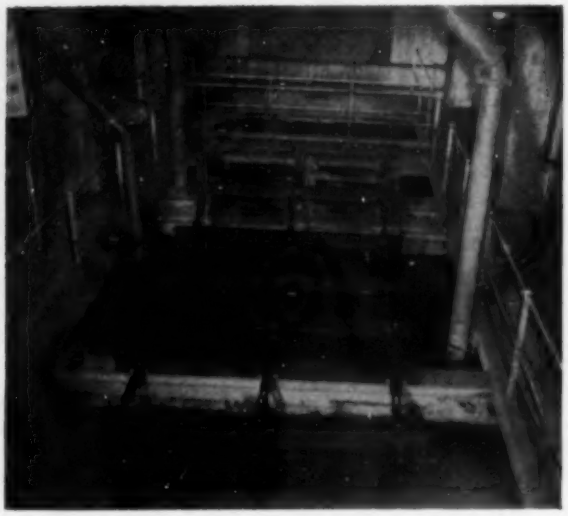
Trailing cables are protected with fused nips and are inspected regularly by the section repairman and the maintenance foreman. To assure that there are no undetected hazards, all belt conveyors are inspected at the end of each work shift after they have been stopped.

Effective control of coal dust is another part of Peabody's safety program. Believing that the best place to control dust is where it is generated, management concentrates its efforts in those places. Good cleanup at the face

JIG separates 8x1¼ into clean coal, middlings and refuse. Middlings are crushed to 1¼x0 and recirculated to jig.

SECONDARY CRUSHER is a ring-roll unit that reduces the oversize from the primary crusher to 1¼x0.

CRUSHED-COAL VIBRATOR separates primary crusher product into plus 1¼, 1¼x¼ and ¼x0 sizes.



SLUDGE TANK receives ¼x0 and water from washed-coal screen. Flight conveyor removes coal which is recovered.

is stressed so that there is as little coal as possible left on the mine floor. Dust on shuttle-car roads is controlled by application of calcium chloride supplied by the Dow Chemical Co. All cutting machines are equipped with sprays to allay the dust during the cutting cycle, and automatically controlled sprays are installed at all transfer points in the belt system. The automatic units deliver water only when coal is on the belt. In addition to the sprays, the main transfer point is enclosed with water-saturated jute brattice cloth to prevent dust from spreading and contaminating rock dust.

To reduce accidents resulting from roof falls, inspecting and sounding mine roof have been integrated in the work cycle. Each foreman carries a sounding rod and tests all roadways one in each cycle of operations. Face workers also inspect and test the roof before starting any work.

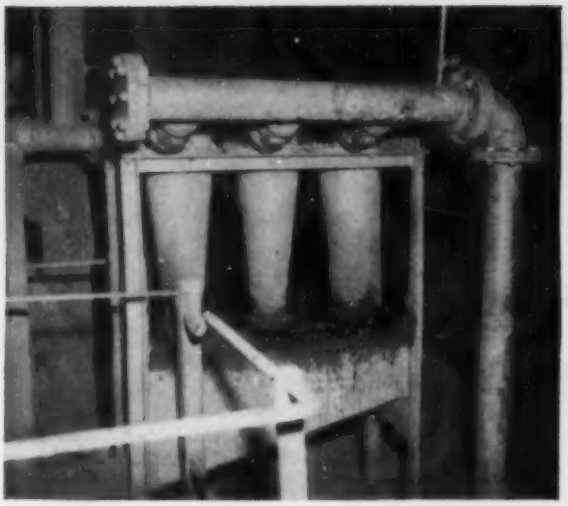
For detecting methane, section foremen carry ¾-size Wolf safety lamps and workmen are supplied with full-size Koehler lamps.

Western Electric telephones are installed underground at all foreman stations, belt heads, at the slope bottom, and at the foot of the air shaft. All motors are equipped with Mines Radio Service trolley phones, and additional sets are installed at the slope bottom, intersection of the main and sub-main belts, underground bin and in the hoist house. Sound-powered telephones, supplied by the U. S. Instrument Corp., are installed at the top and bottom of the underground bin, in the hoist house and in the preparation plant.

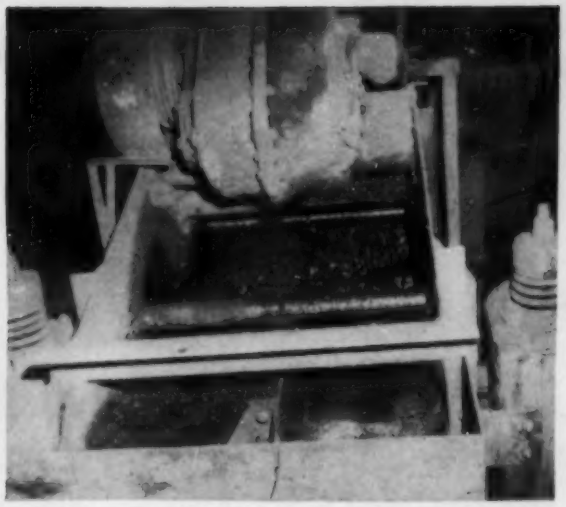
VENTILATION

Air is supplied by a 6-ft Jeffrey Aerodyne fan delivering 150,000 cfm of air at a water gage of 2½ in. A 100-hp 2,300-v Westinghouse motor drives the fan and a fully automatic auxiliary gasoline drive is kept in readiness in the event of a power failure.

Air is conducted into the mine



CYCLONES in series are used to clarify water from the sludge dewatering screen.



SLUDGE DEWATERING SCREEN is divided into sections to handle ¼x0 from drag tank and underflow from cyclones.

through a 19-ft-diameter air shaft and returns to the surface through the slope. From the bottom of the shaft, the air flows south in four of the main-south headings to the intersection with the first east and first west submains, where it is divided into five splits. Two currents ventilate the west sub main, two the east sub main and one the main south development area. A minimum of 9,000 cfm of air is maintained in each of the last open breakthroughs in active areas. All abandoned room panels are sealed and samples of air are taken regularly.

DRAINAGE

Automatic handling of water through a system of pumps operated by float switches is another way Peabody No. 10 conserves manpower. Gathering pumps consisting of four 4x5 and one 4x4 Deming Oil-Rite and three Gorman-Rupp self-priming centrifugal pumps, deliver water to a 1,500-gal sump at the slope bottom. A Gardner-Denver double-acting reciprocating pump, powered by a 20-hp 440-v AC motor and controlled by a float switch, delivers water to the surface through a 3-in line.

PREPARATION

Preparation facilities at Peabody No. 10, designed by Roberts & Schaefer, are geared to process 1,000 tph of Illinois No. 6 coal. Features of the plant include jig washing, oil treating and flexibility that permits coal to be loaded in railroad cars, delivered to four storage bins that serve retail customers, or stockpiled on the ground.

The main slope belt discharges onto a bar screen separating the coal into plus 6 in and 6x0 sizes. The larger size is delivered to a 9x17 Bradford breaker with 8-in openings. Plus 8-in material passes to a rock bin and is removed to a refuse-disposal area by a 10-ton Euclid truck. An apron conveyor carries the 8x0 to a 54-in transfer belt where coal is weighed by a Weightometer before it is separated into 8x1¼ and 1¼x0 on the raw-coal classifying screen. The 1¼x0 is directed to a 42-in belt and weighed by a Weightometer as it is carried to railroad cars.

The 8x1¼ goes to an 8-cell 3-compartment Jeffrey Baum jig and is separated into clean coal, middlings and refuse. Refuse is delivered to the refuse bin and middlings are dewatered and separated into 8x⅜ and ⅜x0 on a 4x10-ft dewatering screen. The larger middlings are broken to 1¼x0 by a Jeffrey Flextooth crusher and recirculated to the jig, and the ⅜x0 is sent to refuse.

Clean 8x1¼ flows over a stationary screen that removes part of the ¼x0 degradation and water, and then is delivered to the washed-coal shaking screen where it is split into 8x4, 4x1¼, 1¼x¼ and ¼x0 sizes. The three larger sizes are loaded into railroad cars by 48-in adjustable loading booms. Each boom is equipped with Viking hot-oil sprays for treating washed coal according to customers needs. Coal is sprayed in suspension with 1,000-viscosity Standard oil.

All 8x1¼ washed coal may be placed on a 12x48 2-compartment mixing conveyor and delivered to an American Pulverizer ring-roll crusher for reduction to 1¼x0. This product may be returned to the bottom strand of the mixing conveyor and delivered to railroad cars, or may be deposited on a 5x12 double-deck Ripl-Flo vibrator for rescreening into plus 1¼, 1¼x¼ and ¼x0. Plus 1¼ is broken to 1¼x0 in a secondary ring-roll crusher and delivered to the mixing conveyor for delivery to railroad cars.

The ¼x0 from the stationary and classifying screens flows to a sludge tank where solids are concentrated and removed to a sump by a drag conveyor. A 4x3 sludge pump delivers the ¼x0 to one section of a 3x10-single-deck Low-Head screen equipped with Bixby Zimmer stainless-steel screen. Underflow from this section of the screen is pumped to three Heyl & Patterson 8-in cyclones where solids are removed and directed to the other section of the dewatering vibrator. Cone overflow goes either to the sludge tank or to a settling pond. Dewatered fines are deposited on a 3x18 degradation flight conveyor, along with the 1¼x¼ from the classifying screen, to be mixed with raw 1¼x0 and loaded as utility coal.

To serve the retail market with four sizes of oil-treated washed coal, a retail-coal section was incorporated in the plant. This section includes facilities for rescreening washed 1¼x0 into 1¼x⅞, ⅞x¼ and ¼x0; a crusher for reducing 1¼x⅞ to ⅞x0; a second vibrator for sizing ⅞x0 into ⅞x¼ and ¼x0; four 100-ton storage bins; and a stacker belt for transferring coal to stockpiles.

During the heating season when retail business is at a peak, bins are kept full and additional coal is stockpiled on the ground. The stacker belt is adjustable vertically and horizontally and is used to transfer 1¼x¼, ⅞x¼ and 8x4 sizes to separate piles. A Hough Payloader is used to load trucks with coal from the stockpile.

"Ideas" Keynote Better Mining

These 14 "Operating Ideas" developed on the job at Peabody No. 10 are typical results of management's continued emphasis on increasing efficiency combined with active encouragement of productive ideas from all employees.

Rubber-Mounted Work Bench Easily Moved

TO HELP maintenance men do a better job, this rubber-mounted supply and work center was developed. Built on a farm-wagon chassis, one of these units is assigned to each loading unit and is kept close to the active working areas. In addition to providing repairmen with a place to work more efficiently, they carry a supply of fast moving repair parts in the small bins and drawers in the middle of the bench. Beneath the work bench and parts areas are built-in cabinets for tools and larger items. A steel sled with drums of lubricants is kept with the unit. Both the portable work center and the sled can be towed easily by a loading machine or shuttle car.

Converted Elevator Improves Belt Loading

CENTERING COAL on belt conveyors is a fetish at Peabody No. 10 and pays off in good belt training and a minimum of spillage. To permit coal from two sections to be loaded simultaneously on one belt without spillage, Joy PL11 elevating conveyors were converted into special belt loaders. These units permit shuttle cars to unload faster and load coal onto the belt parallel to the direction of travel.

Changes made to the original elevators include mounting a turning chute on the discharge end, shortening the slope and overhang sections, mounting on rubber tires and balancing so that they can be moved easily by a shuttle car. The original motor, speed reducer and conveyor chain were used on the remodeled units.

Hoist Moves Equipment, Recovers Steel Timbers

MOVING BELT DRIVES to new locations is a comparatively easy job with the aid of this crawler-mounted hoist. The unit also makes possible the economical recovery of steel-rail crossbars from worked out areas.

A Joy 11-BU loader was stripped to the frame, and a winch and back gearing from a Brown-Fayro hoist was adapted to the loader frame. The hoist is driven through the front clutch of the loader and handles 400 ft of ¾-in rope. A heavy steel support was welded to the front of the loader frame to brace the loader and prevent tipping when there is a heavy load on the rope. The support normally barely clears the mine floor.

Company-Designed Machine Handles Steel Timber

SETTING 90- and 110-lb steel-rail crossbars is done safely and quickly with the help of this 3-wheeled rubber-mounted hydraulically powered timbering machine. Features of the machine include: (1) a hydraulic lift powered by a rear-conveyor jack from a Joy 5-BU loader; (2) a 22-in hydraulically powered cutoff saw designed so the operator must use both hands to start it and have the guard in the proper position; and (3) hydraulic steering and tramming. Power for the hydraulic system is supplied by a 10-hp motor similar to the pump motor on a 10-SC shuttle car. The machine was built to Peabody's specifications by the Manson Machine Co., Taylorville, Ill.

Bulkhead Eases Door Opening

OPENING a mine door against high air pressure was a hard job at Peabody No. 10 until Leo Gilmartin, mine manager, conceived the idea of inserting a bulkhead-type seal that could be opened easily to release the pressure on the door. This two-section all steel door with a bulkhead was built and installed as a result of his suggestion.

To open the bulkhead, the wheel is turned counter clockwise until the square seal has been moved back several inches. Sufficient air then flows through the opening to permit the door to be opened easily.

Locomotive Is Better Ambulance

BETTER AND FASTER handling of injured personnel is possible with this underground ambulance built in the No. 10 shop. Product of ideas contributed by the staff of No. 10, the unit is equipped with first-aid supplies for treating any injury, a stretcher, an MRS radio telephone, and a siren and blinking red light to warn other transportation units to yield the right of way. The ambulance is painted white for easy identification and has three red crosses on each side.

A 5-ton General Electric battery locomotive was remodeled and converted to a trolley unit by removing the batteries, connecting the motors in series and adding the trolley pole. L. H. "Hap" Johnson, safety engineer, shown in the operator's position, points out that injured workers receive a much smoother and safer ride in this ambulance than in a lighter unit because it has the weight to hug the road and is spring mounted. Another advantage is that it will pass through spring-latch switches without danger of derailing.

Built-In Charger Serves Shuttle Car

TO ELIMINATE the problem of handling batteries or driving supply shuttle cars to a charging station, a compact charger was designed and installed on the cars to permit charging from any underground DC power source. Battery-powered cars work in scattered areas and driving the cars to a central point for changing or charging batteries would have consumed considerable time. The built-in unit was developed to eliminate this problem.

When a battery needs charging, the shuttle car is driven to the nearest DC power line, the charger is connected to the battery and then to the DC source with a short length of 2-conductor cable.

Chunk Breaker on Loader Limits Coal Size

TO PREVENT large lumps of coal from getting to the belt-haulage system and causing belt damage or spillage, this chunk breaker was developed and installed on Joy 11-BU loaders. The present design evolved from a combination of ideas contributed by various mine personnel and was built for Peabody by the Manson Machine Co., Taylorville, Ill.

The breaker consists of three serrated disks equally spaced on a shaft free to revolve in the two supports on the loading head. Edges of the disks are hard-surfaced with Stoodite to reduce wear, and the loader has been strengthened to withstand the breaking action.

The first stage in the development of the present unit was the manufacture of a heavy U bar mounted on the loader in an inverted position. Goal of this device was to reduce lumps to the size of the opening by a wedging action created by the forward movement of the conveyor against the lump. This device was not successful because the lumps became wedged in the opening. The next step was addition to the U bar of semi-circular cutters with hardened knife edges in an effort to get better breaking. Considerable improvement resulted from this change and led to the development of the rotating shaft with the serrated disks.

Skid-Mounted M-G Set Housed in Prefab Building

FAST SUBSTATION MOVES, including housing in a new fireproof building, are achieved with skid-mounted m-g sets and prefabricated knock-down steel buildings at Peabody No. 10. The idea for mounting the substations on bases made from I and H beams originated with Carl Lee, retired chief engineer.

When a station is to be moved, the front of the building is unbolted and removed. A crawler-mounted hoist is used to pull the controls and m-g set out to the supply track where they are loaded onto a Phillips carrier for transportation to the new site. If there is insufficient clearance to permit the equipment to be transported on the carrier, 1x5-in steel strips with keys are placed on the rails and the substation is placed on them and skidded to the location. The complete job of disconnecting the station, moving it to a new location and rewiring it in a new building takes about 4 days.

The knock-down building is 6x10x28 ft, with sides fabricated in 4x6-ft panels and the roof in 4x10-ft sections. Two men erect a building in one shift. A spare building is available so that a structure is already assembled and waiting when the substation arrives at the new site.

Metal Stoppings Save Time

BUILDING PERMANENT STOPPINGS to keep up with fast-moving development that advances faces 60 ft per day was a difficult task until sheet-metal stoppings were developed. Now, one man installs two metal stoppings in one shift and there no longer is difficulty in building fireproof stoppings as rapidly as needed. Product of an idea developed jointly by J. Craggs, field superintendent, and Keith McCann, assistant field superintendent, the metal stopping went through several stages of development before its present design.

The first application was corrugated steel sheets made of corrugated steel drain pipe, to close the area around an overcast. This led to experimenting with the corrugated sheets for sealing 14-ft breakthroughs. First units were hand made and consisted of 3x4-ft sheets of corrugated metal bolted to sections of telescopic pipe. This design was unsatisfactory because the sheets were too wide to fit irregular roof and hence too much time was consumed in sealing the openings.

Soon after the idea of a 1-ft-wide telescopic panel was conceived and trial panels for an overcast were fabricated to company specifications. Management saw that this type of panel had interesting possibilities as a cost cutter and decided to use it for making stoppings in 14-ft breakthroughs.

Here's how the first units were installed. The drill crew bored two holes in each rib at the approximate location for the stopping. Holes were drilled about 18 in from the roof and 24 in from the floor. Into each of these was placed a 10-ft piece of 1½x1½ angle iron to which the steel panels were fastened. Joints were sealed with caulking material.

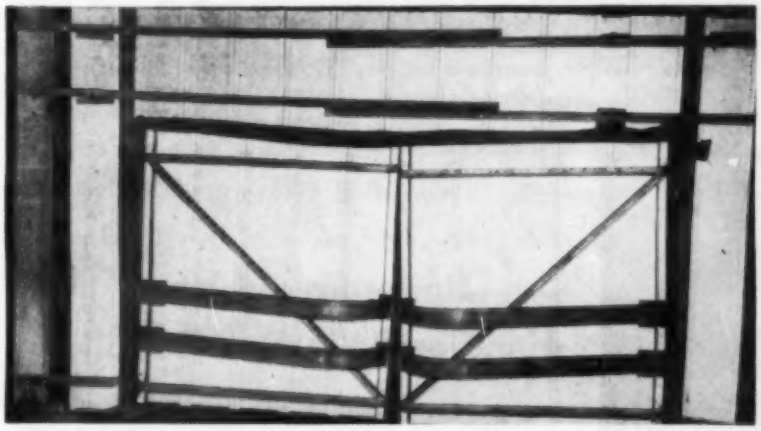
Panels are made of 28-gage copper-bearing steel and are fabricated in 5-ft telescopic sections so a 9-ft stopping can be built if necessary.

The only objection to the metal stoppings was that breakthroughs had to be cut exactly 14-ft wide because panels could not be overlapped if the opening was an odd width. To overcome this, a new-type fastener was developed to permit panels to be overlapped.

Success of the early installations led management to adopt them for all stoppings. As a result of using them near the face of active workings, one more change was necessary. Concussion from coal breaking sometimes damaged the stoppings, so some method had to be devised to eliminate it. As a result, two spring-hinged concussion doors were installed in each stopping in the areas where concussion was causing damage. Doors are mounted in panels interchangeable with solid panels so that they can be replaced easily as the faces advance. Panels now are sealed with a special tape supplied by the Minnesota Mining & Mfg. Co.

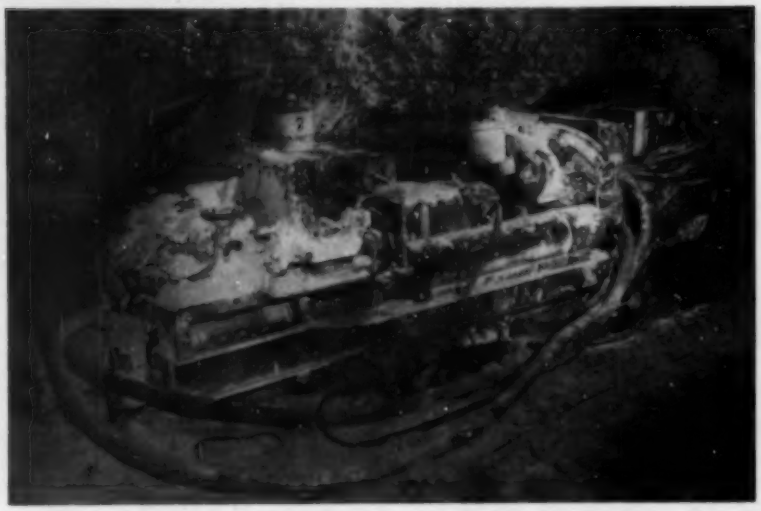
Peabody's latest application of the telescopic interlocking panels is for building a box-shaped overcast which will be combined with vertical panels to make a complete unit. Two men will be able to install one in two days.

Cost of one of the 14-ft stoppings is about the same as for a masonry seal but the metal units can be recovered for future use. Damaged panels also can be straightened very reasonably by returning them to the manufacturer who reshapes them.



Double-Swinging Steel Doors Easily Installed

PROVIDING GOOD VENTILATION to working faces is aided with these easily constructed all-steel doors used on shuttle-car haulageways. The door shown at the left was set up in the shop as a pilot model and has interlocking telescopic steel panels in the door and the frame. An underground installation on a jack is shown in the right photo. Both doors are salvageable and can be moved to a new site in a short time.



Crawler-Mounted Unit Handles Three Jobs

ROCK-DUSTING, applying sand-cement coating and supplying compressed air are handled by this versatile unit. Originating from ideas contributed by Keith McCann, assistant field superintendent, and Leo Gilmartin, mine manager, the machine was built for Peabody by the Manson Machine Co., Taylorville, Ill. Components of the machine include the first electrically driven Jetcreter, a Joy WL80 compressor mounted on a modified T-5 truck. A 35-hp Reliance motor salvaged from a Joy 5-BU loader drives the compressor and the Jetcreter.

When used for cement work, the unit is operated as a standard Jetcreter. When used to rock dust, the machine is not connected to a water line and rock dust is placed in the hopper in place of the sand-cement mixture. If only compressed air is needed, the clutch connecting the Jetcreter to the 35-hp motor is released, permitting the compressor to run alone.

There were several stages to the development of the machine as it is today. First was the purchase of the Jetcreter with the 35-hp motor to be used for applying a sand-cement mixture to headings near the slope bottom. This was a custom-built unit since a Jetcreter had never before been powered by an electric motor. The unit was mounted on wheels and air was supplied by a compressor transported on a crawler-mounted truck. Rock-dusting was tried with the machine at the suggestion of Mr. Gilmartin and proved to be very successful. Then, Mr. McCann suggested that the Jetcreter and the compresser be combined into one unit and mounted on the truck. A design sketch and all the component parts for making the present unit were supplied to the Manson Machine Co., Taylorville, Ill. who assembled it in their shop.

Special Fastener Prevents Air Leakage

PREVENTING LEAKAGE around a man door in an overcast is achieved with this simple fastener. The steel door fits into a steel frame which has two tapered steel blocks welded to each side and is tightened into place by turning a free-swinging steel strap attached to the center of the door. As the strip is turned clockwise, it moves farther up the tapered blocks and the seal becomes tighter.

Underground Hoist Handles Palletized Supplies

TRANSFERRING materials from supply cars to shuttle cars for distribution in the section is done quickly and easily with the aid of a 1-ton Yale hoist mounted on a mine rail suspended from the roof. Supplies are delivered underground in pallets or bundles as far as possible to simplify the underground job. With the aid of the hoist, two men handle easily all types of supplies. The monorail is held in place with short roof bolts placed through holes in support straps welded to the ball of the rail.

ONE OF THE LARGEST stripping units now operating in western Pennsylvania, this electric-powered 13-yd dragline must remove 13,000 cu yd per day to expose coal that will be loaded within 24 hr. Planned maintenance keeps down-time at 10.5% of available time.

Close-Coupled Strip Mining Demands Careful Planning

With loading following stripping by not more than 24 hr, the stripping unit must advance at a steady pace to avoid becoming a bottleneck. Buckeye Coal Co. relies upon careful planning and effective maintenance.

By HAROLD DAVIS
Associate Editor, COAL AGE

EFFECTIVE MAINTENANCE, well-planned stripping methods and constant study of operations to search out further improvements make it possible for officials at McCurdy mine, Buckeye Coal Co., Grove City, Pa., to achieve their goal of removing 13,000 cu yd of overburden per day in producing 850 tons of coal daily. The job is complicated by the fact that quicksand lenses in the highwall spill out into the pit, making it necessary to load out coal as soon as possible after it is exposed to avoid having it covered again by such slides. For this reason loading follows within 24 hr after the stripping unit has uncovered the coal.

A standby loading shovel is available at the pit to assure continuity in loading. Therefore, responsibility for the steady progress of this close-coupled stripping and loading job and for daily production rests squarely upon the stripping unit, an electric-powered 13-yd dragline, one of the largest now operating in western Pennsylvania. The dragline operates three 8-hr shifts per day, 5 days a week, with total down time averaging 10.5% of available working time. Lunch time for the operators as well as all other delays is included in this total down time.

Production at McCurdy is from the 54-in Brookville seam which lies under from 60 to 70 ft of cover. The mine was opened in April, 1953, to provide steam coal for the steel mills of Buckeye's parent, Youngstown Sheet & Tube Co., Youngstown, Ohio. Prospect drilling shows reserves sufficient for several years at the present rate of recovery.

Officials in charge of Buckeye's stripping operations include: R. P.

1. FLEXIBLE LINES permit lubrication of dragline fairleads while machine is in operation.

2. HARD-SURFACING on bucket shroud, round bars on tooth bases and steel plate increase useful life.

5. AT MARSHALL PIT, small shovel scarfs 2-in binder out of 34-in seam to reduce ash-content 5%.

6. DEFLECTION SHEAVE on boom prevents slap in hoist rope. White markers on highwall show up trailing cable.

Eight Ideas for Increasing Over-All

Bremner, assistant to the vice president in charge of operations, acting for the parent company with headquarters at Youngstown; M. A. Voelm, superintendent of strip mines; S. D. Winger, in charge of exploration, development and reclamation; and C. J. Lindstrom, mining engineer and foreman at McCurdy. The company also operates a smaller mine, known as Marshall mine, in the 34-in Mercer seam near New Castle, Pa., under the same supervision.

KEEPING DRAGLINE WORKING

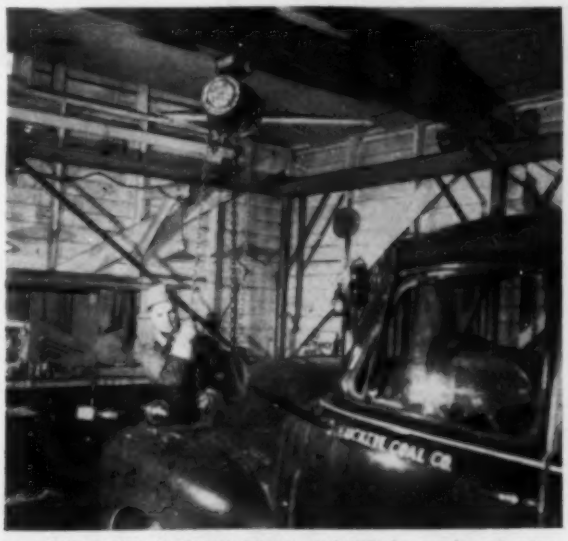
As mentioned, the dragline is removing about 13,000 cu yd per day, and the goal of Mr. Voelm and his associates in field operations is to achieve this stripping average without too much variation from one day to the next. Effective maintenance makes it possible, Mr. Voelm says, and here are some of the practices found to be particularly valuable in keeping the dragline in action.

Three 13-cu yd buckets are rotated about every 15 days, from actual service, into the rebuilding shop and then into standby service. Performance studies on the buckets have resulted in the adoption of standard modifications which include the use of Harcote No. 55 hard-surfacing around the leading edges of the bucket to increase the life of the shroud approximately 25% and the use of round steel bars welded onto the tooth bases to prevent excessive abrasion. The bottom

3. CRAWLER ROLLERS and similar parts are built up with automatic welding at 25% of cost of new parts.

4. PIT PUMPS are mounted in carrier frames which may be hoisted by dragline for relocation.

7. TWO-COMPARTMENT TANK carries fuel to field units. It may be removed to release truck for other jobs.



8. SHOP-MADE MONORAIL HOIST is made of pipe standards, spare beams and track rollers from bulldozers.

Stripping Efficiency at Buckeye Operations

and sides of the bucket are lined with Yoloy plate.

Bucket teeth are changed every 5 days, the drag rope is resocketed every week and turned end for end every 10 days, and the hoist rope is resocketed every 2 wk. These duties are scheduled for Saturdays, whenever the machine is not in operation, or to coincide with the lunch periods of the operators on working days. Planned maintenance work is scheduled during the annual miners' vacations, employing outside help if necessary to get the work done before the miners return.

A Buckeye idea makes it unnecessary to shutdown the dragline every 4-hr to permit lubrication of the drag-rope fairleads, as formerly required. This recurrent delay was eliminated by providing flexible lines leading from fittings inside the cab, to all lubrication points on the fairleads. Now the oiler can service the fairleads while the dragline keeps operating.

The dragline also features synchronous reaving, particularly applicable to electrified machines in this class, which results in savings of 16% as compared with previous power requirements. In synchronous reaving, the drag clutch remains engaged while the motor is reversed to pay out the drag rope under power during the hoisting cycle. Hoisting speed is increased because of the pendulum motion imparted to the bucket. This action also accounts for savings in the

LOADING SHOVEL and bulldozer build haulage road in pit out of fireclay and furnace slag to reach coal now being uncovered by dragline.

PROPER POSITION of dragline on top of highwall results in less than 90-deg swing.

CAR-LOADING HOPPER permits fast truck dumping and controlled loading of coal for Youngstown steel plants.

HAULAGE ROADS are made of 2 ft of unscreened slag on top of fireclay subgrade. Ditches take pit water to sump.

AUTOMATICALLY CONTROLLED MAIN PUMP removes water from main sump and discharges outside the limits of the pit.

BUCKEYE STAFF: C. J. Lindstrom (left), mining engineer and McCurdy-pit foreman; M. A. Voelm, superintendent of strip mines, S. D. Winger, exploration, etc.

life of brake blocks on the drag drum, which has tripled since the change.

Sheaves, crawler rollers and such items are rebuilt by continuous welding at the steel company's main shops at Youngstown to provide 90% of the original life at 25% of the cost of new replacements. Most of the heavy repair work is done at Youngstown, although spot repairs are made at smaller shops at both McCurdy and Marshall, each staffed by a mechanic and a helper. A shop truck, carrying a diesel-powered welding machine, is available for field repairs.

Scheduling is important in Buckeye's maintenance program. The maintenance crew boards the dragline at each day-shift lunch period to take advantage of this necessary delay in discharging preventive maintenance duties. The work of the oilers is arranged so that a change of shifts can be made with a delay of only 3 min to perform the few tasks the oiler could not do while the machine is in operation.

MOVING COVER AND COAL

All of the Brookville seam within the boundaries of the McCurdy tracts is below natural drainage. Therefore, the first order of business in preparing to open the mine was to determine the lowest part of the seam from drilling records, thus locating the point where the initial opening should be made in order to provide a natural sump.

This was followed by construction of a haulage ramp on an 8% grade down to this low point and the preparation of the sump area. The pit was opened with a box cut, 215 ft wide at the surface and 90 ft wide on the coal, beginning at the bottom of the ramp and worked to a distance of 1,800 ft north and 2,000 ft south. Overburden cuts now are 75 ft wide with the work now in the fourth cut. The dragline begins a cut on line with the haulage ramp and works to the north limit of the property, then deadheads back to the starting point to work a cut toward the south limit. The haulage ramp, as it is extended westward, splits the property. The machine walks at a rate of 700 fph.

No attempt is made to construct a bench at a lower elevation for the dragline. It has been determined from experience that the material in the highwall varies to such an extent that valuable time would be wasted in trying to provide a bench of sufficient bearing strength to support the 600-ton machine. Therefore, the dragline lays a level pad of shale for itself on top of the highwall as it advances.

The cuts are limited to a maximum width of 75 ft to limit the swing required of the dragline. The swing angle usually is between 45 and 90 deg.

Immediately above the coal is a layer of shale which varies from 0 to 30 ft thick. It is this material which is used in the cushion for the dragline. A layer of it also is deposited on the bottom in new spoil areas to provide a permeable zone through which water can drain out of the spoil areas back to the sump.

Two diesel-powered shovels, equipped with 3-yd coal-loading buckets, are used in loading the coal, one active and the other a spare. Final cleaning of the top of the coal is done by a bulldozer and a 1½-yd high-lift, rubber-tired tractor. The haulage contract is held by Mooney Bros., New Castle, Pa., who operate five 15-ton trucks for moving the coal 1½ mi from the pit to the railroad-car loading chute.

The railroad-car loading point is equipped with a car puller for spotting the cars under the chute, although the cars run by gravity otherwise. The empty track holds a sufficient number of cars to permit loading of 1,800 tons. Two men are stationed here during the single loading shift to operate the car hoist and to take general charge of the loading point.

The remainder of the working force at McCurdy includes three operators and three oilers for the dragline, three bulldozer operators at the pit and one on reclamation work, an operator and an oiler for the loading shovel and two utility men in the pit. The maintenance force includes a mechanic and a helper, an electrician, two welders and a second-shift mechanic.

PROVIDING AUXILIARY SERVICES

Good haulage roads and a well-planned drainage system also contribute to over-all efficiency at McCurdy by preventing delays which in the final analysis could adversely affect the working time of the dragline, the bellwether of operations.

In building haulage roads, Buckeye officials make use of both native materials and bank slag which is hauled in from the steel mills at Youngstown. Bottom material under the Brookville seam is fireclay. This is piled up along the centerline of a cut as the coal is removed for the double purpose of providing drainage ditches and making a raised base for the pit road. Then a course of shale, stripped off the coal by the dragline, is laid on top of the fireclay to a thickness of from 18 to 24 in. The main haul road is built of 1 ft of unscreened bank slag which is broken up and compacted by bulldozers as they shape up the road. A 2-in layer of screened slag is added to dress the top of public township roads used in traveling from the pit to the loading point. In all instances, roads are 24 ft wide to permit two-way traffic at all points.

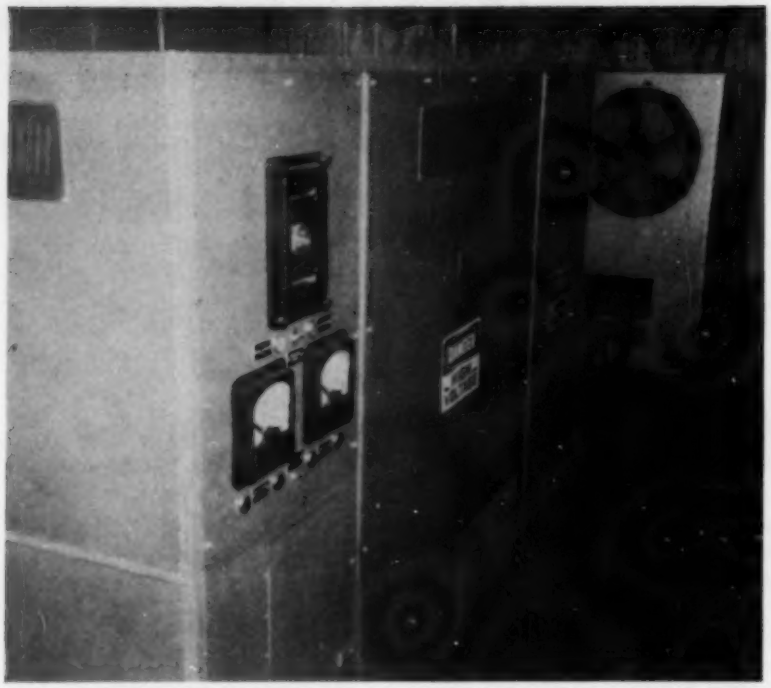
Drainage facilities have been designed with the object of promoting gravity flow to a central sump, insofar as possible. As previously mentioned, this flow is achieved by (1) opening pits at the lowest-possible seam elevation, (2) laying a permeable layer of shale on the bottom in spoil areas and (3) ditching through the fireclay on both sides of haulage roads in the pits.

The main pump at McCurdy is a skid-mounted 8-in unit driven by a 60-hp electric motor. The pump is rated at 2,000 gpm, and operates about 6 hr per day. A float switch controls the on-and-off functions of the pump, and an electric heating coil is provided to prevent freeze-ups in cold weather. Other pumps, including two 8-in and one 6-in units and a 4-in diaphragm pump, are driven by gasoline engines, providing portable units to fill spot assignments.

Permanent discharge lines are constructed of Youngstown 8-in steel pipe and the pit lines of spiral-welded pipe with wedge-lock couplings. Power for the main pump is provided by a portable 75-kva substation which steps down 4,160-v power to 220 v.

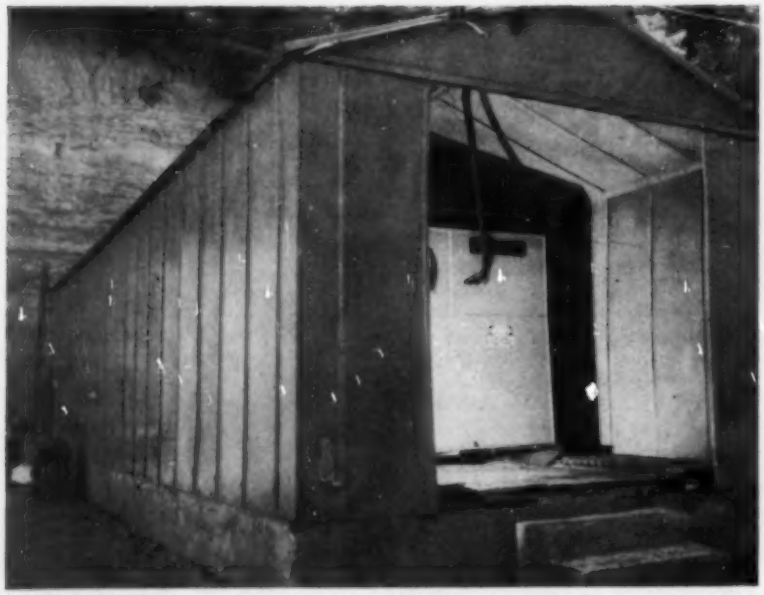
The 4,160-v power for the dragline is provided by a 1,000-kva substation which is supplied on the primary side at a potential of 69 kv by the power company. Some 8,000 ft of pole line and 2,500 ft of trailing cable transmit the 4,160-v power from the substation to the dragline.

Reclamation of the stripped land is not allowed to lag stripping by more than 2 yr. Spoil banks are rounded and leveled to satisfy the requirements of Pennsylvania state reclamation laws, and then these areas are planted in poplar, locust and various evergreens. Buckeye has been operating in the area since 1940 and some of the older spoil areas now support dense growths of these trees.



TWO SKID-MOUTED UNITS make up the selenium-rectifier installation, with the high-voltage cabinet in the foreground and the low-voltage unit at the rear.

Selenium Rectifier Serves Russell Fork 3A



AMPLE SPACE for maintenance and ventilation are provided in generous-sized steel building housing the rectifier substation.

By A. M. AYERS
Superintendent
Russell Fork Coal Co.
Praise, Ky.

TO SUPPLY additional DC capacity when continuous miners absorbed all available conversion capacity, the Russell Fork Coal Co., at Praise, Pike County, Ky., selected an American selenium rectifier. The price, incidentally, was a few per cent lower than a conventional rectifier unit but was not the major factor in the selection of the new unit.

This new 300-kw selenium substation, made by the American Rectifier Co., 95 Lafayette St., New York City, was installed in March, 1954, in a metal building near the portal of the mine it serves, and has operated with a minimum of attention and no maintenance. It supplies Mine No. 3A, and is not operating in parallel with any of the four tank-type rectifiers from which the Russell Fork mines have been deriving power since their opening.

EFFICIENCY 85%

Output voltage is automatically regulated by the magnetic-amplifier method. Efficiency is about 85% at full 300-kw load and 83% at 25% overload. The 85% efficiency level is reached at about 30% load, and remains level beyond full load.

The unit is contained in two cabinets, and the company requested that these be placed on steel skids composed of 8-in channels on edge, with both ends rounded to form double-end runners. The No. 1, or high-voltage, cabinet is 5 ft 10 in by 7½ ft, and is 6 ft 8 in high. Weight, including skids, is about 4½ tons. Dimensions of the No. 2, or low-voltage, cabinet are 5 ft 10 in by 8 ft 11 in, with a height of 6 ft 8 in. Weight, with skids, is about 3½ tons.

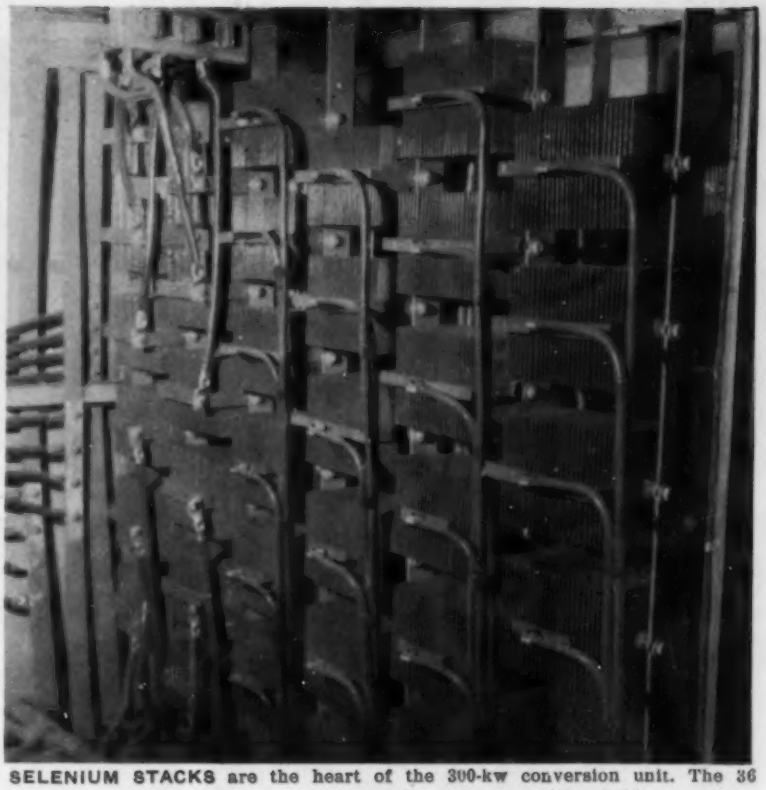
A 14x36-ft steel building 8 ft high to the eaves was erected for the substation. A smaller building could have been used, but the larger was selected to provide ample room for maintenance and ventilation. Skidding the cabinets into the building and hooking up was done in minimum time. Only six leads, from marked lugs, were necessary to connect the two cabinets. The only other wiring was to bring in the 2,300-v input leads and run out the 275-v output cables. Output voltage is controlled by one knob.

EQUIPMENT ARRANGEMENT

The No. 1, or high-voltage, cabinet contains an Allis-Chalmers 4,160-v automatic-reclosing oil circuit breaker, main transformer, auxiliary transformer, auxiliary control transformer, current transformers, a fan and instruments. Transformers are air-cooled and can deliver full load without the fan operating. The fan is an economical means of adding a safety factor and giving the main transformer additional capacity. Instruments mounted on the control panel of No. 1 cabinet consist of a 0-3,000-scale voltmeter, 0-100 ammeter, and a G.E. Type ACR reclosing relay.

The No. 2, or low-voltage, cabinet contains voltage-regulating equipment, selenium stacks, two fans and an I-T-E Type KC automatic-reclosing DC breaker rated at 1,600-amp continuous, 50,000-amp maximum, interrupting current. The control panel of No. 2 cabinet carries only two instruments: a 0-500-scale voltmeter and a 0-2,000 ammeter.

Selenium stacks number 72 and are mounted in two rows back to back. This large number of stacks permits removal of one or two without noticeable effect on output. A stack can be replaced in about 10 min.



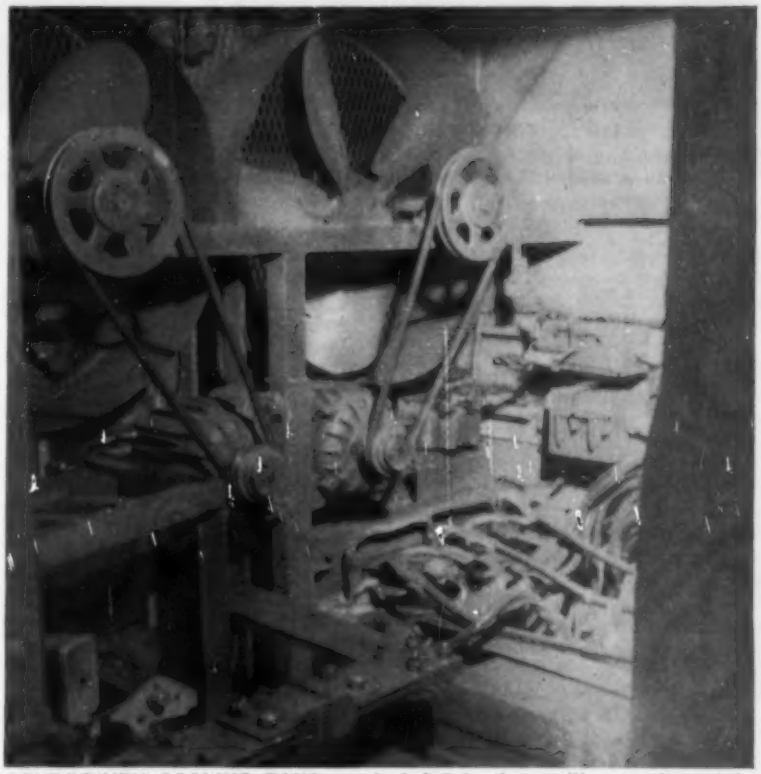
SELENIUM STACKS are the heart of the 300-kw conversion unit. The 36 stacks shown here are backed up by an additional 36.

COOLING PROVISIONS

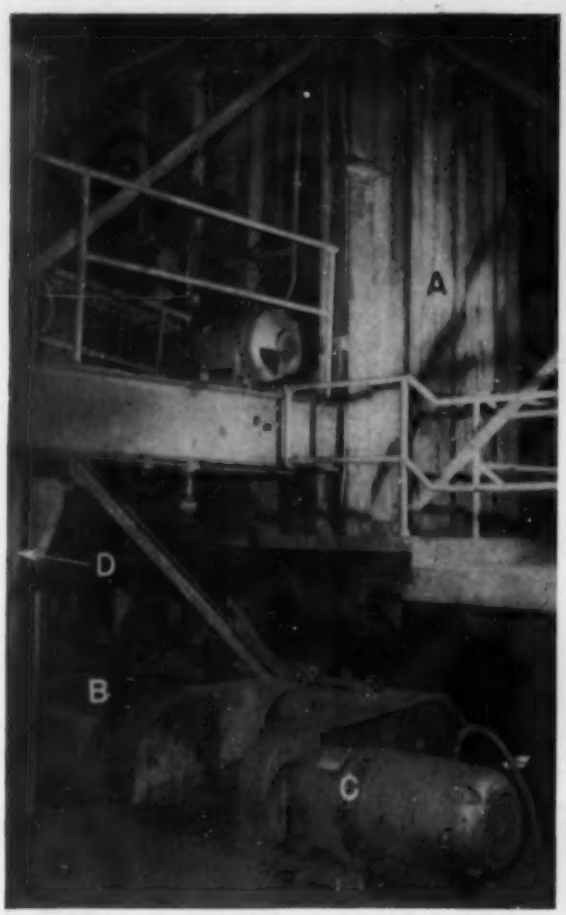
Cooling fans, the only moving parts of the rectifier unit, are V-belt driven by totally enclosed dustproof 3-phase motors, each controlled by its own magnetic contactor and each having its own wind switch. Although the rectifier can carry a partial load with only natural ventilation, the fans must be operating for normal use. As a safety factor, each fan moves enough air to permit carrying nearly full load. The rectifier can be operated at no load with no fans running, but any attempt to close the DC circuit breaker either by solenoid or manually will close the trip circuit and throw out the breaker.

The fans were purposely made belt driven, and the Allis-Chalmers motors were wired so that a motor can be easily replaced. An oversize V-belt is used, and at the same time the motor has a base for tension adjustment. A tapered motor pulley with sleeve permits changing with only a wrench.

Before the rectifier was purchased, Otis Elswick, chief electrician for the Russell Fork Coal Co., made a trip to the American Rectifier factory. He was favorably impressed with the relatively short stacking as a factor in preventing loose connections, and also by the 200% load tests that the individual items receive before rectifier assembly.



BELT-DRIVEN COOLING FANS are included in the auxiliary equipment in the front end of the low-voltage cabinet.



STORING WASHED FINES—80-ton bin (A), discharge of removal conveyor (B), one of two 20-hp drives (C) and vertical run of encircling gravity-discharge conveyor (D).

AS STORAGE BIN becomes nearly empty, one of the three chains serving the right-hand half of the bin is exposed.

WET FINE COAL in a 3-in layer 6 ft. wide, being pulled out from one-half of the bottom of the bin and dropping into the mixing conveyor.

Storing Washed Fines

Bin added at Amherst Coal plant absorbs surges and stores end-of-shift centrifugally dried fines from the water circuit. Handling packed fines requires sturdy conveyors and drives.

By A. S. J. HOPKINS, Vice President, Engineering
Amherst Coal Co., Lundale, W. Va.

BIN STORAGE of fine centrifugally dried coal is a desirable feature in a washing plant because:

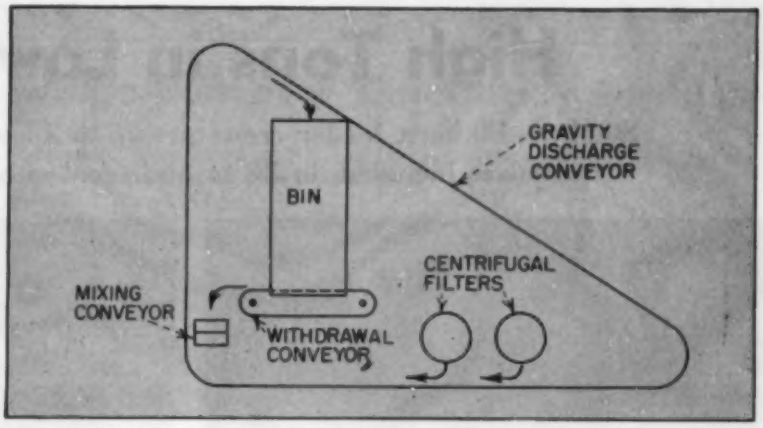
1. It facilitates blending fines with the coarse washed product in a uniform quantity regardless of the variation of fines in the raw-coal feed.

2. It permits cleaning the water circuits of fines at the end of the shift without slugging one or two cars with excessive fines. Cleaning the circuits prevents settlement and avoids the "freezing" of conveyors and plugging of pipe lines.

Several years ago, the Amherst Coal Co. added a storage bin for centrifugally dried ¼x0 coal in its No. 1 plant, at Amherstdale, Logan County, W. Va. The several problems involved in dragging the packed coal from the bottom of the bin were anticipated and overcome.

Raw-coal feed to the plant is in excess of 400 tph and the minus 5-in is washed in a Link-Belt jig. The washed product passes over an Allis-Chalmers Low-Head screen with the equivalent of ¼-in round openings. Through product is discharged to a concrete sump, from which it is moved by an

NO. 1 PLANT of the Amherst Coal Co., where installation of a storage bin for wet fine coal has proved doubly effective by insuring uniform blending and permitting clearing the water circuit of fines to avoid settlement.



HEAVY-DUTY CHAIN DRIVE—A twin of this motor-fluid drive, V-belt, herringbone gear and roller chain is located on the far side and takes care of the other half of the withdrawal conveyor (background). Plant-installation diagram (right) shows relation of bin and conveyors to existing mixing conveyor and centrifugal driers.

elevator to a collecting hopper where it is mixed with water in such quantity as to permit the mixture to flow by gravity to two Bird centrifugal filters. The dried product is conveyed to the storage bin by a gravity-discharge conveyor.

Shape of the bin was dictated largely by the limited space available in the plant. It measures 12x12 ft, is 20 ft high and has a capacity of 80 tons.

The coal is withdrawn from the bin by six chains of the square-link type installed side by side and running on the flat steel bottom of the bin. The chains are Link-Belt Class H-104, wing, 6-in pitch, rated at 4,160-lb allowable pull and 28,000-lb ultimate strength.

The preliminary calculations showed that a sprocket drive shaft of cold rolled steel would have to be 8½ in in diameter to handle the chain. Since such a shaft would have required the use of sprockets of a larger pitch diameter than desirable, a compromise was made on a 4½-in shaft of special alloy. After 2-mo operation, however, the alloy shaft failed and was replaced by two shorter shafts of the same size and material, mounted in line so that each one drives half the conveyor, or three chains.

The change included replacing the one long tail shaft with two shorter shafts. Each drive shaft is driven by a General Electric 20-hp Tri-Clad motor with a Link-Belt "Electrofluid" drive, V-belt, Link-Belt herringbone gear with a ratio of 1,660 rpm input and 45.9 rpm output, and finally a roller chain.

This double drive has proved very satisfactory because it permits operating one-half (three chains) of the withdrawal conveyor at a time. In case of chain failure, the bin can be emptied by the other drive and repairs made when convenient. Withdrawal rate is regulated by an adjustable gate on the discharge bin. Operating one half of the conveyor provides a steady stream of coal 6 ft wide and 3 to 5 in deep flowing to the mixing conveyor and thence to the car.

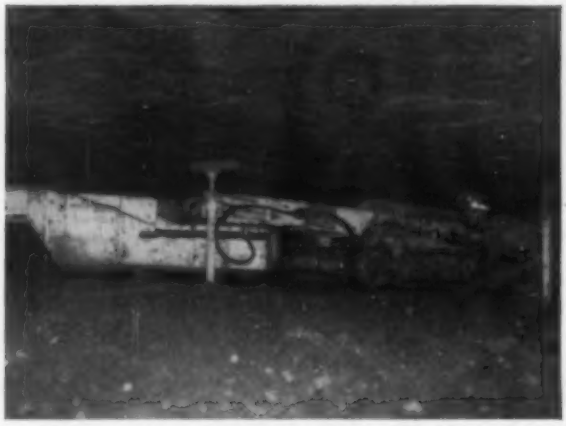
Withdrawal is adjusted to a constant rate so that at the end of the shift the bin is emptied or nearly so, although at times during the shift there may be a build-up of 40 to 50 tons in the bin. All the cleanup fines at the end of the shift are stored until the start of the next shift, when they are fed into the coarser coal while the fines from the oncoming shift are still in the water circuit.

The bin was placed in available space between the mixing conveyor and Bird filters, but at a higher elevation so as to discharge directly into the mixing conveyor. The gravity-discharge conveyor which moves and elevates the wet fines from the filters to the top of the bin encircles the bin, two driers and mixing conveyor.

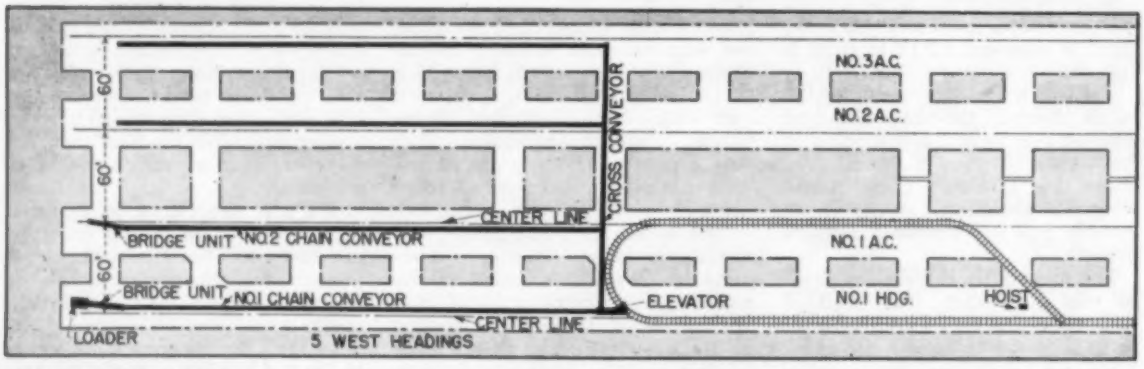
BRIDGE CONVEYORS behind loading machines at Wilson Creek mine are key to . . .

High Tons in Low Coal

Stephens-Elkhorn loader crews get up to 25 tons per man, conveyor moves included, in 30 to 36-in coal with bridge conveyors.



CHANGING PLACES—at left, loader and bridge conveyor are being backed for unhooking; at right, loader has been unhooked ready to tram to other place. Note end of room conveyor at lower right.



DRIVING FOUR HEADINGS with one loader, two bridge conveyors, four room conveyors, a cross conveyor and elevator.

TEN TONS OF CLEAN COAL SHIPPED per man on the payroll was the average production for the first 4 mo of 1954 at an eastern Kentucky underground mine in a seam averaging 34 in, and ranging from 30 to 36 in. Joy 12-BU machines load the coal into Long Piggybacks, and Jeffrey and Long chain conveyors deliver to mine cars. During the month of January the average production per man employed on the sections, including the foremen, was 21.14 tons, including conveyor moves to establish new loading points.

The operation is the Wilson Creek mine of the Stephens-Elkhorn Fuel Corp., Manton, Floyd County, Ky. A. H. Mandt is vice president and general manager, and Cecil Sherman is superintendent. The company was organized in 1932 to take over an abandoned lease of Elkhorn No. 3 seam which yields a high quality, low-ash, low-sulphur, medium-volatile coal for domestic and steam markets.

1,149 TONS; 115 MEN

Operating double shift and four days per week during the first 4 mo of this year, the production average was 1,149 tons per day with a payroll of 115 men, including the superintendent and those employed at the preparation plant, offices and retail store.

Favorable conditions are a level seam with local grades not exceeding 3%, no parting, a top of firm shale, no gas and a bottom which for the most part consists of a firm fireclay. Limited working height is the one big difficulty.

In 1945, the original hand loading into mine cars was changed to hand loading into conveyors. In 1949, a 300-tph 4-track steel tipple with jig washer was installed. The next step was to install the loaders and Piggybacks, and early in 1953 the entire production was switched to that method.

PRODUCTION MAINSTAYS

Equipment consists of three 12-BU loaders and six Piggybacks. Cutting is done principally with five Goodman Type 512-EJH shortwalls with hydraulic controls, bugdusters and 8½-ft cutterbars equipped with Goodman chains using Kennametal bits. Drilling is done with Chicago Pneumatic No. 572 hand-held fast-feed electric drills using Kennametal bits. The coal is shot with permissible powder.

The chain conveyors discharge to a Jeffrey elevator at the car-loading point, served by a loop or circle haulage. Spotting is done with a Brownie hoist. Car equipment consists of 150

PREPARING FOR LOADING, cutters and drillers work in one place while adjacent place is being loaded out.

Bridge-Conveyor Time-Study Results

Analysis of time study, 12-BU Joy loading machines with Piggybacks, 9 Rt Section, Stephens Elkhorn Fuel Corp.

Coal loaded, 260 tons. Eight faces cleaned up during the shift. Average heights of 36 in and widths of 36 ft were mined during the shift, with good top, grades and bottom. Sectional crew left outside at 6:45 A.M.; arrived at face at 7:09 A.M. Supplies were run back at start of shift, requiring 16 min. Sectional crew left face at 2:19 P.M.; arrived outside at 2:45 P.M. This crew consisted of the following men:

2 men, loading machine.
2 men, cutting machine.
2 men, timber and pan-up.
1 man, utility (greaser).
1 man, boom operator.

Following is breakdown of time study on above loading:

Cut No.	Time in Minutes per Place				
	Total	Loading	Wait on Coal	Tram	Delays
1	43.0	25.0	....	....	16.0, supply
2	85.0	55.0	21.0	2.0	9.0, chain
3	35.0	33.0	....	2.0	.....
4	53.0	38.0	12.0	3.0	.....
5	57.0	42.0	10.0	5.0	.....
6	47.0	41.0	4.0	2.0	.....
7	72.0	49.0	5.0	3.0	15.0, no cars
8	47.0	39.0	....	4.0	4.0, no cars
	439.0	322.0	52.0	21.0	44.0

73.3% of working time spent loading coal.
11.8% of working time spent waiting on coal.
4.8% of working time spent tramming loading machine.
10.1% of working time lost due to delays.

Average loading time per place	**40.2 min.**
Average time waiting on coal per place	**6.5 min.**
Average tram time per place	**3.0 min.**
Average time lost per place due to delays	**6.3 min.**
Loading rate during shift	**0.807 tpm.**
Tons lost due to delays during shift	**74**

Section foremen and men are very efficient.

15-TON MAINLINE LOCOMOTIVE 25 in high delivers a trip to the outside trestle leading to the dump hopper.

FOUR-TRACK STEEL TIPPLE includes jig washer. The dump hopper behind the plant at left holds 375 tons.

Sanford-Day 2¾-ton dropbottom cars 24 in high. Gathering is done with two General Electric 6-ton locomotives 28 in high, which barely clear the mine roof. One General Electric 15-ton locomotive 25 in high handles the 3½-mi main haul. A 6-ton trailing locomotive equipped with Femco Trolleyphone is used on the trip as a safety factor and to assist if cars are derailed.

This main haulway, practically all underground, is on 60-lb rails. Originally, height was gained by taking top. A change to taking bottom eliminated trouble because the roof, if undisturbed, holds very well. A man portal, established out in the country at a drift several miles by highway from the tipple, has cut the underground travel for the men to 1½ mi.

MINE DEVELOPMENT

The mining plan is room-and-pillar and room pillars are not recovered. A typical section setup, based on work in No. 5 West Headings, is shown in the accompanying plan. The four headings are driven 30 ft wide on 60-ft centers. No. 1 heading and No. 1 aircourse are advanced 340 ft. Then the equipment is moved through the first open crosscut inby the cross conveyor. While No. 2 and No. 3 aircourses are advancing, the loaded car track is extended to the next boom hole and the empty track is laid on around and back to the cross conveyor. After No. 2 and No. 3 aircourses are advanced to catch up with No. 1 heading and No. 1 aircourse, and the last two breaks are completed, the equipment is moved through the center pillar breakthrough to resume No. 1 heading and No. 1 aircourse advance.

No. 1 heading is driven with one rib line 11 ft to the left and the other 19 ft to the right of the center line, while No. 1 aircourse is 19 ft to the left and 11 ft to the right. The chain conveyor in No. 1 heading is positioned 4 ft to the right of the center line, while in No. 1 aircourse it is 4 ft to the left. This arrangement permits completion of breakthroughs from either place.

Empty mine cars, after being turned at a central side track and proceeding to the section, are coupled to the rear end of the trip being loaded without lost time. The loaded cars are gathered and the hoist rope is returned to the loading point and hooked to the empty cars while the loading machine is being trammed from one Piggyback to another in the adjacent place. Femco Trolleyphone communications between the loading point and the last open crosscut, and also with the gathering-locomotive, facilitates this synchronization of equipment and avoids lost time.

SECTION PERFORMANCE

Nine men, including the section foreman, comprise a section crew. In the accompanying time study the foreman is not included. This study was made by a representative of another coal company which became interested in the high efficiency attained by Stephens-Elkhorn in such low coal. We are indebted to Mr. Mandt for a copy of the report.

While the time study shows 262 tons produced by 9 men (including the section foreman), or 29 tons delivered to the mine cars per man-shift, it will be noted that the more significant data are those including the moves. For the months of January, February, March and April, 1954, the tonnages delivered to mine cars per man-shift were 21.14, 19.84, 25.76 and 23.35.

SPARE SECTION PROVIDED

A change recently completed, resulted in the establishment of three operating sections and one standby section. When one of the three regular sections is stopped for moving, the crew will be shifted to the standby section to maintain consistent daily tonnage.

Roof bolting with a C-P RBD-30 unit is done in the few places where bad top is experienced. This drill also is employed to install trolley hangers, and also, with a special Kennametal bit, for channeling roof for raising and guarding the trolley wire (p 116).

DC at 275 v for underground operations is supplied by three substations. One is a 200-kw General Electric portable rectifier installed underground, and the other units are 150-kw rotary converters installed outside.

The preparation plant, on the C. & O. Ry. and built by McNally-Pittsburg, is capable of handling 2,500 tons in an 8-hr shift. Cars dump into a 375-ton storage bin. Primary equipment consists of a main shaker, picking table and a Jeffrey diaphragm jig, which washes minus 3-in. The plant includes four Allis-Chalmers vibrators, one Low-Head for dewatering and three Ripl-Flo for screening stoker coal. Tyler stainless-steel cloth is used on the vibrators.

A Jeffrey single-roll crusher is installed for crushing egg, and a McNally-Pittsburg double-roll unit crushes 3x1-in oversize. Two of the four loading tracks are equipped with booms.

The main office of the company is near the preparation plant at Manton, while the mine office is at the man portal where the shop and bathhouse also are located. Rufus Stephens is general day foreman of the mine, and Roy Music is general night foreman.

get *extra* savings in *easy* cutting with KENNAMETAL*

At a large colliery in West Virginia, one set of Kennametal U8R3 Bits cut 1440 30-ft. places at a bit cost of only $.0013 per ton. Previous costs here had been reasonable because of relatively easy cutting conditions, yet use of tough Kennametal Bits not only *reduced* these costs, but produced better coal, with less dust.

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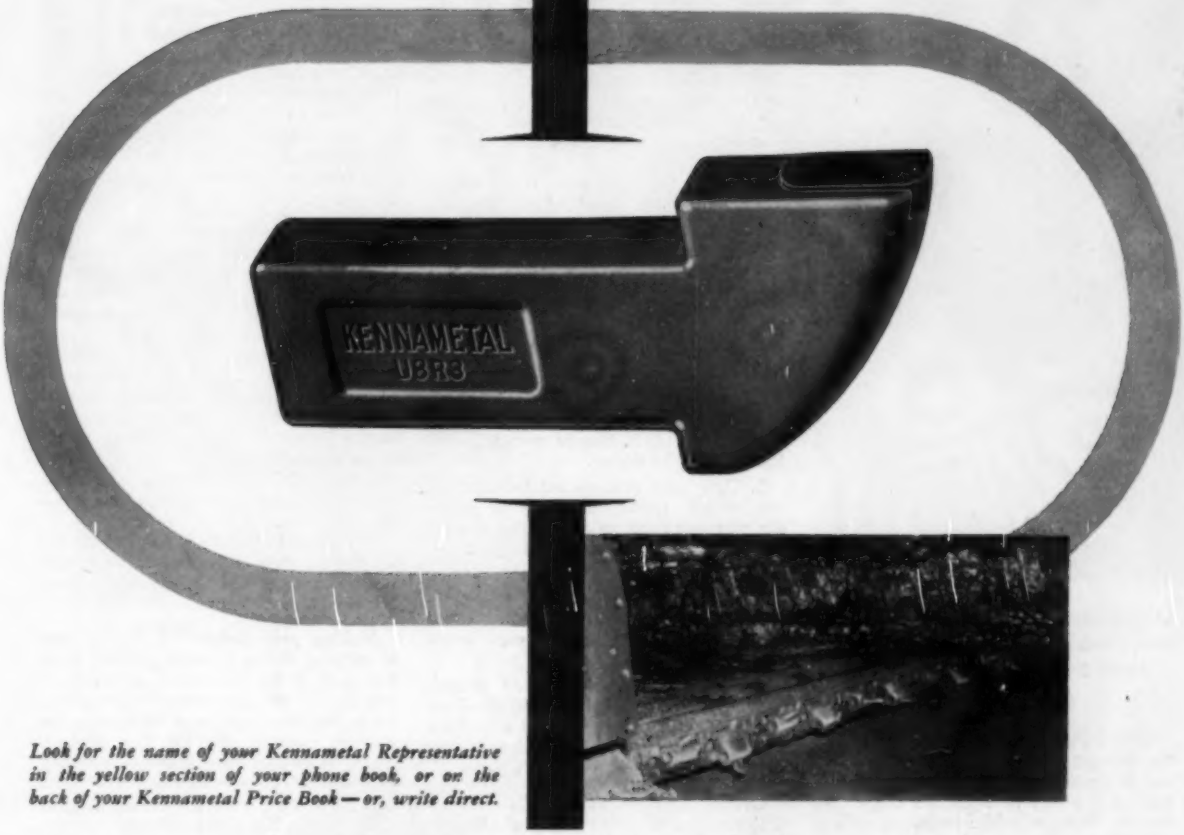
Kennametal Bits — the economical answer to *severe* cutting problems — can also effect *extra* savings in ordinary cutting conditions because they stay sharp longer, take harder knocks than any other tungsten carbide. Your Kennametal Representative would like to go into your mine and demonstrate. Call him anytime.



Look for the name of your Kennametal Representative in the yellow section of your phone book, or on the back of your Kennametal Price Book — or, write direct.

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KENNAMETAL INC., MINING TOOL DIVISION
BEDFORD, PA.
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World's Largest Manufacturer of Tungsten-Carbide
Drill Bits, Cutter Bits, Roof Bits, Strip Bits

FOREMEN'S FORUM

Speaking in Public

In addition to their other duties, supervisors may find it necessary to prepare and present short talks to groups of men; for instance, at section safety meetings. Here are some helpful hints.

H. Armstrong Roberts

SUCCESSFUL SPEAKERS organize their talks, speak sincerely, make their points, then stop talking

DOES YOUR BLOOD RUN COLD at the thought of standing on your two feet and projecting your voice and your ideas toward a group of upturned faces? Do you sit through public meetings with a constant fear that the chairman or toastmaster might call upon you to say a few words? If you suffer these symptoms, don't be discouraged. You are perfectly normal! We are quite certain the same misgivings assailed Daniel Webster and William Jennings Bryan as they approached their earliest oratorical efforts.

We recently had the privilege of attending a series of sessions devoted to setting up some principles and practicing the techniques of oral communications, led by Prof. Harold Schmidhauser, of the New York State School of Industrial and Labor Relations, Cornell University. We found the sessions to be of great value, so we consider it proper that we share some of our good fortune with you. You may wish to apply some of these hints in your talks at section safety meetings, for example.

First and foremost, you must have an interesting subject to talk about. To solve this problem, choose an important subject, one that is of direct concern to your listeners. If it carries this importance, you can make it interesting.

The next order of business is the organization of your talk. Your material should be assembled in such a manner that your presentation satisfies four requirements, as follows:

1. Get the attention of your audience. Wake them up if they're asleep. Shock them if they're dopey.

2. Give your reasons for bringing up this subject. Having alerted your listeners, you owe them an explanation of why you think they should listen to you.

3. Now state your case. In this portion of your talk employ striking examples, quotations from well-known sources and direct references to personal experiences among your listeners.

4. Make your point. Even though you may have satisfied the first three requirements, your listeners still may have a "So What?" attitude. Your job is to convert that attitude into one of agreement.

Getting Attention—Humor is all right if the subject of your talk permits its use, but the humor had better be good. A startling statistic may focus the attention of the audience, but the statistic had better be newsworthy. An unusual twist may be a good lead-off, but the twist had better be one that you can link to the main body of your talk without too much trouble. On the other hand, you might start off with a visual gimmick, something you can hold up before the group. Money, for instance. Everybody is interested in that.

Giving your reasons—Now you have attention, and you have presented the subject of your talk in the process of garnering that attention. The question now in the collective mind of your audience is: "Well, why bring that up?" So you must tell them. Tell them why the subject is of importance to them and, perhaps, why they need to know more about it.

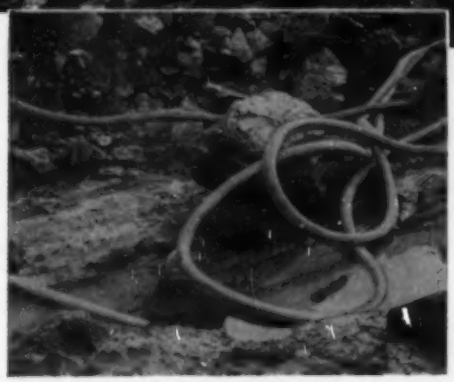
Stating your case—Notice how the structure of your speech is building up. First you demanded attention, then you explained why you rate that attention, and now you are ready to fill in the details on this matter you choose to speak about. One of the best ways to drive your points home is to illustrate them with familiar examples. Be certain the examples apply to the points being made. And if you use quotations, be sure they apply to the issues also. You may have to restrain yourself here. If the examples and quotations don't fall into your theme naturally, chuck them, no matter how beautiful they are.

Say all you should say to clear up the subject for your listeners, but be careful not to run on and on after you have achieved this objective.

Making your point—This is the time to suggest action if getting action from the group is the objective of your talk. If you hope to get the support of the group for a plan you have in mind, now is the time to make a plea for that support. There is danger here also of becoming long-winded. Choose your words with the goal of making your point with all possible brevity. Then stop talking.

Well, there's a 4-point sequence you can use in organizing and presenting a talk on almost any subject under the sun. It is designed to satisfy the natural demands of the audience as these demands show up in order.

But it really isn't easy. Even with an interesting subject and excellent organization of the talk, you still face the chilling moment when you must stand up and



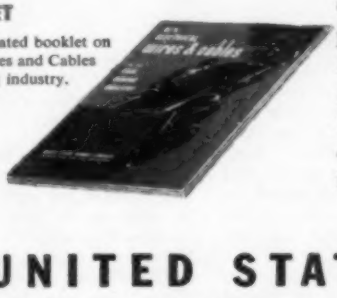
Note excellent flexibility of U.S. Royal Shielded Cables.

There's plenty of "drag miles" in U. S. ROYAL SHIELDED TRAILING CABLES

The constant dragging, flexing, twisting and bruising encountered in heavy service do not bother U.S. Royal Shielded Cables. The rugged jacket contains 60% by weight of neoprene; this jacket is cured in lead—all for more durability, more "drag miles". Consider also more than just the initial cost! Achieve a new low in your cable replacement costs—a new high in performance by specifying U. S. Royal Shielded Trailing Cable, the cable that can take a beating and come back for more.

FREE BOOKLET

Send for free illustrated booklet on U. S. Electrical Wires and Cables for the coal mining industry.



Here's the key to U. S. Royal's great performance; United States Rubber Company is the only electrical wire and cable manufacturer to grow its own natural rubber, manufacture its own synthetic rubber and its own plastics. This means *control of production* every step of the way—resulting in a better and more efficient product.

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How to organize a talk . . .

Here is a section safety talk, reprinted from the June, 1954, issue of *The Safe Mine Foreman*, a publication of the accident-prevention department, Coal Div., Eastern Gas & Fuel Associates, Mount Hope, W. Va. We have inserted headings and comments to show how the structure of this talk builds up.

GETTING ATTENTION:

All right, men, it's time for another of our weekly safety meetings. One time a little boy asked his grandfather why he didn't get a hearing aid so he could hear more. The old man said, "Son, I hear more now than there is any use of."

GIVING REASONS:

What I'm going to tell you today will be of use to you, so cock up your ears and listen.

STATING THE CASE:

First, the company wants this to be a safe mine. If it isn't as safe as it should be it is because somebody is making mistakes which the company doesn't want made. Sometimes I make the mistakes and fail to operate this section as safe as I could and should, but that is not the way the company wants me to do the job.

Sometimes it is you who make the mistakes. Sometimes some of you will take chances in spite of all I can do to get you to work safely. If you take a chance just remember one thing, it's not the way the company wants you to work. [Note the use of personal references.—Ed.]

Let me tell you why the company wants this to be a safe mine. Because the company is a group of men, just like you and I. In fact, you and I and the superintendent, and the other officials and the stockholders are the company. We and they are human. You are just as interested in our fellowmen as they, and they are just as interested as we. None of us want men to be injured.

A lot of accidents and injuries at a plant gives the plant a bad reputation. You nor I nor the officials nor the stockholders want to be part of a bad reputation.

There is another good reason why everybody in the company wants a safe mine. It costs money to have accidents. Every mashed finger costs plenty before it is well again. If a man gets killed it costs close to $6,000 in compensation and medical expenses. That is only part of the total cost; the remainder is in the indirect costs of lost production, damaged equipment, disorganization of personnel, investigation, hiring and training a new man and hundreds of other indirect costs. The officials of the company have a lot better use for 10 or 12 thousand dollars than burying it.

That money will buy a lot of cable or a lot of timber. It will pay for a lot of repairs to equipment or for many other things.

Right now some of you are thinking, "The company wants me to be safe so it can save money." Remember, you are part of the company, and it is true that part of the reason the company wants you to be safe is to save money.

Whose money? Why, their money and yours. How much will you save by carrying out the safety rules? Do you know how much you are worth? [Note these provocative questions and the striking examples which follow.—Ed.]

Suppose you are 42 yr old. You will have about 20 yr more of working life at about $4,000 per yr, which will be about $80,000. If you are 32 yr of age you can figure you will earn about $120,000 before you retire—if you are safe and well enough to work those next 30 yr.

The money the company can save by keeping you alive will buy a new shortwall cutting machine. But what can you buy with a hundred grand? New car, home, vacation, put your children through school, and thousands of other things.

MAKING THE POINT:

Now tell me, who profits most when you work safely? You or the company? Why take a chance of losing your life or of losing a hundred grand by doing the things the company safety rules forbid you to do. [Note the short, sharp conclusion. Stop talking here.—Ed.]

---

start talking—all alone. Nervous? Certainly! Well, let's talk about stagefright.

Quivering knees and shortness of breath are not "all in the mind." These are real physical reactions. Every intelligent, sensitive speaker has felt these reactions upon standing up to deliver his first few speeches. What really happens?

Prof. Schmidhauser tells us our diaphragms are the culprits, from all indications. There seems to be some direct link between an apprehensive mind and a hair-trigger diaphragm which causes the latter to tighten up. The result is reduced lung volume, naturally followed by shorter breathing and faster heart action. And with more blood concentrated around the lungs, heart and diaphragm, there is precious little left to stiffen our legs. No wonder knees quiver.

Now that we know what causes stagefright, what do we do about it? Satchel Paige has the answer in one of his ten rules for longer useful living. Mr. Paige, the timeless baseball pitcher, says: "When your stomach disputes you, lie down and think cool thoughts."

In applying that sage advice to our problem, we might come up with these suggestions:

1. Knowing the cause of the trouble, you can set your mind in action to effect a remedy. The remedy is deeper breathing, of course. A couple of slow, deep breaths will force the diaphragm to release its grip.

2. Calmly survey the room and audience as you sit by, waiting to do your stint. Do it even though you don't feel very calm.

3. As you breathe deeply, frame in your mind the first few words you are going to say. Think cool thoughts, in other words.

4. Plant yourself firmly in speaking position before you begin to speak. Don't be in too great a hurry to get started. Rub the shine off the ball and use the rosin bag, so to speak.

As you gain control of your nervousness you get a bonus. That is, you will be in better voice. Resonance of voice is born in your relaxed chest cavity. A thinner, piping voice will come out if a tight diaphragm has reduced the volume of your chest.

The ability to organize a talk logically and to handle stagefright intelligently are the two most prominent characteristics of successful speakers. There is one more element, however, demanding consideration. That is the control of mannerisms. Here are some don'ts to guide you:

1. Don't hang your head. Start out by choosing a single listener, look at the knot in his tie, and talk to him. (If you look him straight in the eye he may distract you.) Then move from one listener to another with your eyes because you want to address yourself to the entire group.

2. Don't put your hands in your pockets. Hands-in-pockets is a relaxed position and your audience may take a cue from you and go back to sleep. If you feel uncomfortable with your hands at your sides, clasp them in front of you. You'll be able to keep them under control that way.

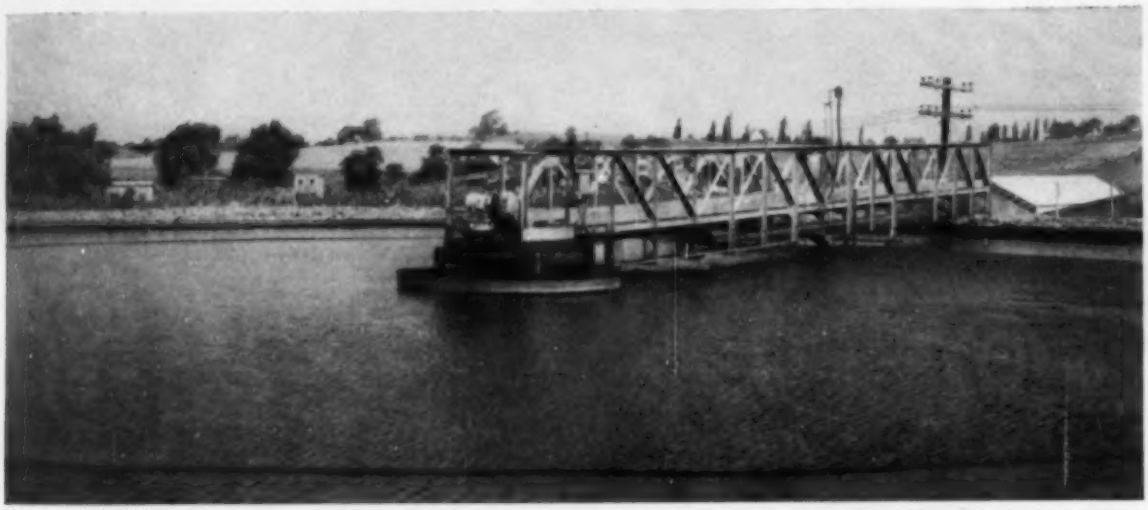
3. Don't pace back and forth. Have enough interest in what you are saying to permit you to hold still and say it.

One final hint is in order. Don't memorize your talk. Few of us are called upon to make lengthy talks, which in some instances may have to be read. Usually, in presenting relatively short talks, it is possible to organize one's thinking around several key points and to talk naturally on these points. A memorized talk can hardly be sincere, and sincerity is the hallmark of good speakers.

Of course you can't become an accomplished speaker merely by reading this material, any more than you can learn to mine coal by reading a book about it or learn to swim by watching someone else take swimming lessons. Speaking in public, like all other skills, is learned by doing. Then practice and more practice makes perfect.

COAL AGE

OPERATING IDEAS



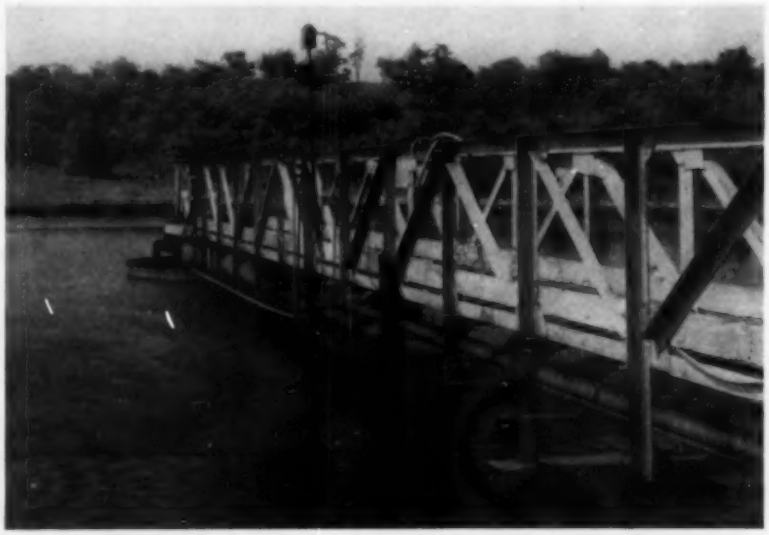
OVER-ALL VIEW across 75-ft thickener, with overflow launder in foreground and top of basin on far side.

Earth Basin Cuts Thickening Cost

AN EARTHEN-BASIN THICKENER—familiar in the nonmetallics industry for clarification of wastes and recovery of plant water—is being used for the first time in the coal industry at the Hostetter (Pa.) washing plant of the Jamison Coal & Coke Co. A 50-ft-diameter Dorr Type S thickener mechanism in a 75-ft-diameter earthen basin dewaters plant refuse, producing a clear overflow for return to the main washing plant. Use of the earthen basin reduced the cost of the installation appreciably as compared with conventional types of tank construction.

The earthen basin at Jamison is in the general form of an inverted truncated cone. The bottom, slightly over 50 ft in diameter, slopes gradually toward the center at the same angle as the thickener rake arms. Earth sidewalls are banked upward at about 45 deg to form the 75-ft over-all tank diameter. Solids settling in the outer unraked section of the basin flow down the steep sidewalls by gravity and are picked up by the rake arms which, as in conventional units, convey them to a central discharge port.

Refuse at 8 to 10% solids is pumped to the thickener at a rate of 550 gpm. Underflow averaging 35% solids is thickened to approximately 65% solids in a Peterson TFR Roto-Disc filter and delivered to a standard Peterson TFR disk filter. The cake from the disk filter is discharged to refuse. As the filters are equipped with wire cloth, the cloudy filtrate is recirculated to the thickener feed. Refuse contains fine coal and pyrites, with 1.8% retained on 100 mesh and 13.2% on 200 mesh; 73.8% of this feed passes a 325-mesh screen. During initial operation, fine-coal silt sealed cracks and openings in the basin, with the result that no water is lost by seepage through the bottom or sidewalls.



WASHING-PLANT REFUSE containing 8 to 10% solids is clarified at 550 gpm in this earthen-basin thickener recovering water for re-use at Jamison.

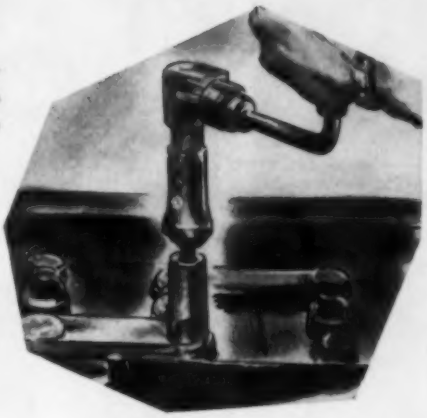
"DO IT YOURSELF" MAINTENANCE TIPS
from the GOULD Plus-Performance Plan

HERE'S MONEY-SAVING MAINTENANCE TIP #1

Accidental damage in even the best regulated operations can put a cell out of commission. Here's a tip from the Gould Plus Performance Plan on how to easily remove and repair a cell.

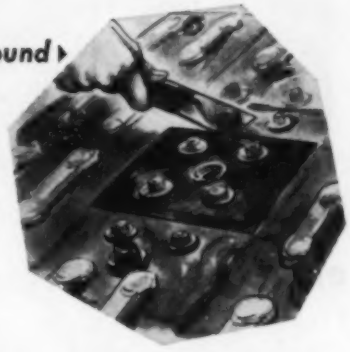
1. Remove Connectors ▸

We recommend using a special drill (Gould Part No. 35459C) which allows the cell post to remain by cutting the bond to the lead insert of the cover.



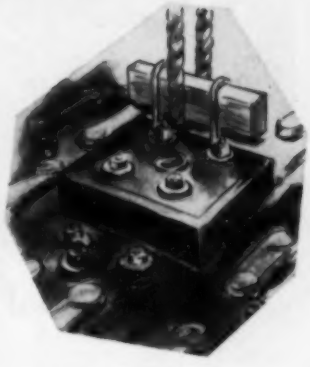
2. Remove Compound ▸

from between jar to be removed and adjacent cells. Use a warm compound knife for this purpose. Pour a little penetrating oil or kerosene mixed with regular oil into space between cells for lubricant.



3. Pull the Cell ▸

The best way is to screw a Gould Cell Puller (Part Number 77061) to the negative post remaining after drilling in No. 1. Then attach hoist and lift. If a cell has two negative posts, use two cell pullers, attaching the hoist to a piece of wood placed through the cell puller loops.



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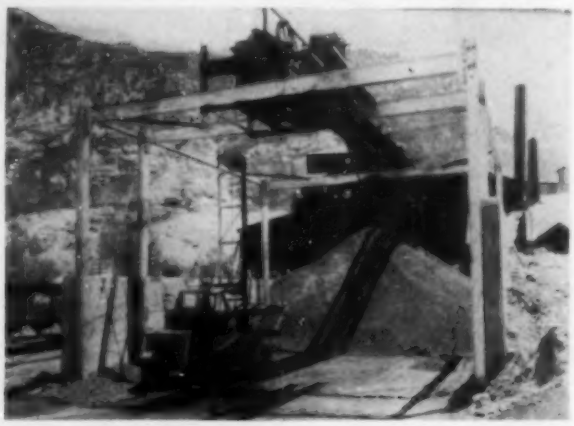
Trolley Wire Channels Cut at Lower Cost

CHANNELING LOW ROOF at crossovers (left photo) to raise the trolley wire for clearing the tops of locomotives, mine cars and other mobile equipment, and to guard the wire, is done with a roof drill and special bit at Wilson Creek mine of the Stephens-Elkhorn Fuel Corp., Manton, Floyd County, Ky. (p 106).

Cutting a channel 40 ft long in the firm shale top is accomplished now in one man-shift instead of three.

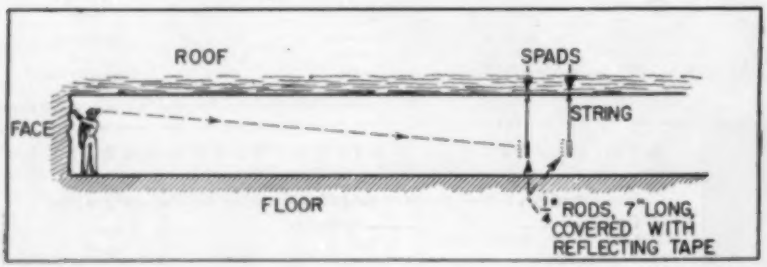
A Type RBD-30 Chicago-Pneumatic electric-motor-driven roof drill is used in channeling. A special 5¼-in-diameter Style SD Kennametal bit with ¾-in square shank and a 1⅝-in diameter pilot 6 in long, shown in the photo at the left by Dexter Caudill, chief electrician, was built by Kennametal, Inc., to company specifications for the job. The pilot holes provide places for installing trolley hanger expansion shells. The roof drill and special bit also are used for regular handling of trolley wire.



Coal Storage and Reloading Made Easy

LOW COST and convenience feature the coal storage and reclamation facilities at the Royal mine of the Royal Coal Co., Royal, Utah, shown in the accompanying photographs. The storage area is alongside the empty tracks above the plant, and was outlined by pouring concrete retaining walls of the desired height and length along two sides.

Storage coal is brought out from the plant by a scraper conveyor mounted on A-type legs, except at the outby end where, to provide a parking area for trucks during loading, the conveyor was put on overhead beams. Reloading is done by a Scoopmobile, which can operate between the A-frames and the retaining walls, and thus can work back the entire length of the storage area, if desired in reclaiming the coal from the pile.



Reflecting Rods Permit One Man to Extend Centers

WITH THE AID of two metal rods covered with Scotchlite tape, one man can extend the centerline of a working place to the face, writes Victor S. Veazey, Pratt, W. Va. The rods are hung in the last set of spads and the man extending the centerline walks to the face, shines his light on the rods and puts himself on the centerline. He then marks the center on the coal face or on the roof.

To make the job of sighting easier, one rod is covered with white tape and the other with red. Strings for hanging the rods are attached to ring eyes in the ends of the rods.

Electrical answers for more efficient coal preparation

From his electrical experience with three of the world's largest coal laundries, R. L. Killebrew, Westinghouse Engineer, points to lower cost operation by coordinating:

CONTROLS to centralize operation

MOTORS AND GEARMOTORS for dependable power

POWER CENTERS for economic power distribution

Our aim is to help you take maximum advantage of electric power to increase the profit possibilities in processing a chunk of coal like this. The first step calls for planning electrically to coordinate drives, control and power distribution so that only a few men are needed to maintain peak operation of the cleaning plant.

Starting at the planning stage and through equipment installation, Westinghouse has found many ways to unburden you, and your cleaning plant designer, of electrical problems. Let's take a look at the results in terms of more efficient operation.

NEXT PAGE, *how coal handling becomes more automatic.*

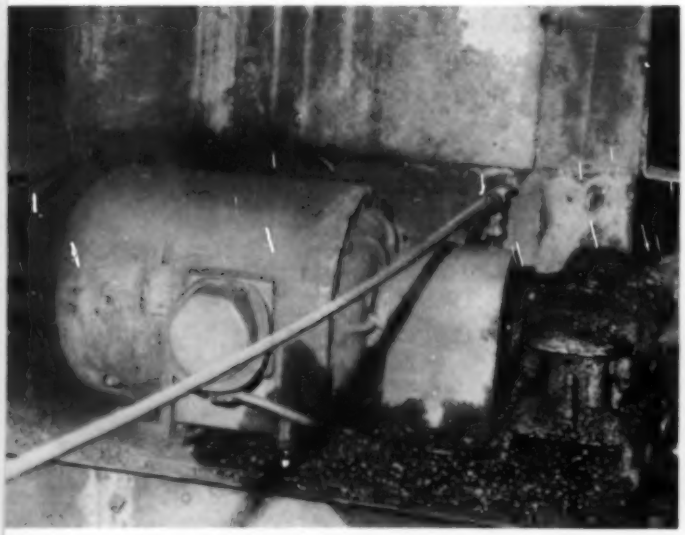
These engineers make up a team typical of Westinghouse service in depth. Consulting and application engineers coordinate equipment application. Your sales representative expedites manufacture and delivery. Field service engineers speed installation, testing, and are available for help of any kind.

Plan automatic coal handling to reduce man power, increase tonnage

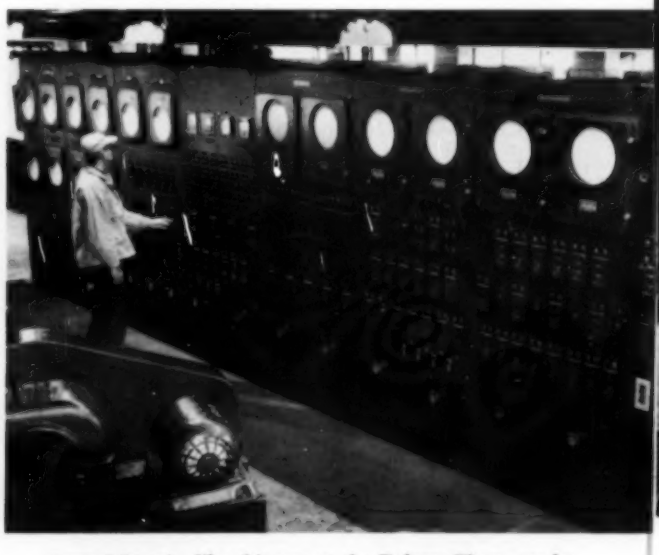
At Hanna's Georgetown Plant, Cadiz, Ohio, only 5 men, using Westinghouse Drive Equipment and Centralized Control, clean 1500 tons of coal per hour. One man loads 5 railroad cars simultaneously. Three electric eyes help weigh the loaded cars.

At J&L's Vesta Plant, Fredericktown, Pa., 2000 tons per hour of high-grade metallurgical coal are cleaned and blended for steelmaking. Coordinated Westinghouse Controls, Motors and Gearmotors power the whole operation, allowing one man to feed and unload the giant blending bins.

U. S. Steel's Robena Plant, Robena, Pa., turns out 1200 tons of coal per hour. Through the large, Westinghouse-equipped, control board, one man starts and automatically controls related conveyors and process equipment.



This Life-Line motor in TEFC enclosure can't be stopped by coatings of abrasive coal dust at J&L's Vesta Plant. The motor's sealed, pre-lubricated bearings never need greasing. Dirt can't be pumped into the bearing by frequent greasing.



Control boards, like this one at the Robena Plant, can be placed in out-of-the-way locations or in pressurized rooms. Sequence motor starting automatically starts equipment in proper order. Individual motor control is also provided.

Dependability—key to profitable automatic operation

The demands of continuous coal processing have shown the operators of these plants the value of dependable Westinghouse Drives, planned to meet operating conditions such as:

Moisture, dust and dirt are shrugged off by the 4-way sealed, pre-lubricated bearings of the new Life-Line® "A" motor. Both a labyrinth and flinger-type seal on either side of the bearing prevent entry of foreign matter or the escape of grease. Drip-proof and TEFC enclosures are available.

The Life-Line Starter is protected against dust and moisture by the right enclosures, too, as well as by the simple design of its single moving armature. The armature is balanced on a knife-edge bearing that cannot collect dust to cause sticking or jamming.

Variable loads, too, may interrupt continuous plant operation by overloading motors and circuits. Here's where the extra capacity of the Life-Line "A" motor steps in. Its new Bondar conductor insulation has high resistance to the effects of heat, built up by temporary overloads. Under severe loads, the Life-Line Starter provides dependable protection for the motor. Current is interrupted by the control's bi-metallic, disc-type relay which remains accurately calibrated during years of use.

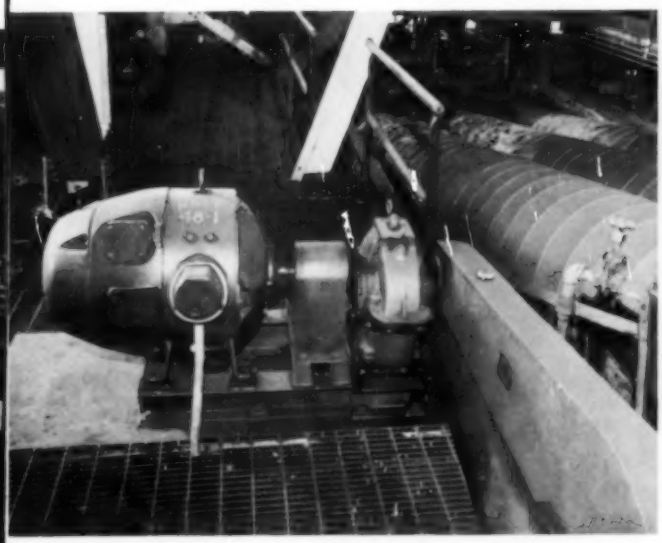
Inspection and servicing are limited on Westinghouse Geared Drives. Gearmotors and speed reducers, for instance, are designed with a horizontally split gear case. This allows access to all parts without draining oil, dismantling or disconnecting the load.

In addition, from the time your drive is installed, any one of 56 Westinghouse Field Service Offices provides immediate inspection or repair should equipment be damaged. Thirty-eight Westinghouse Manufacturing and Repair Plants are also available across the country to provide factory-type rebuilding for equipment that can be moved.

NEXT PAGE, ***how power distribution forms the framework for economy*** ▶

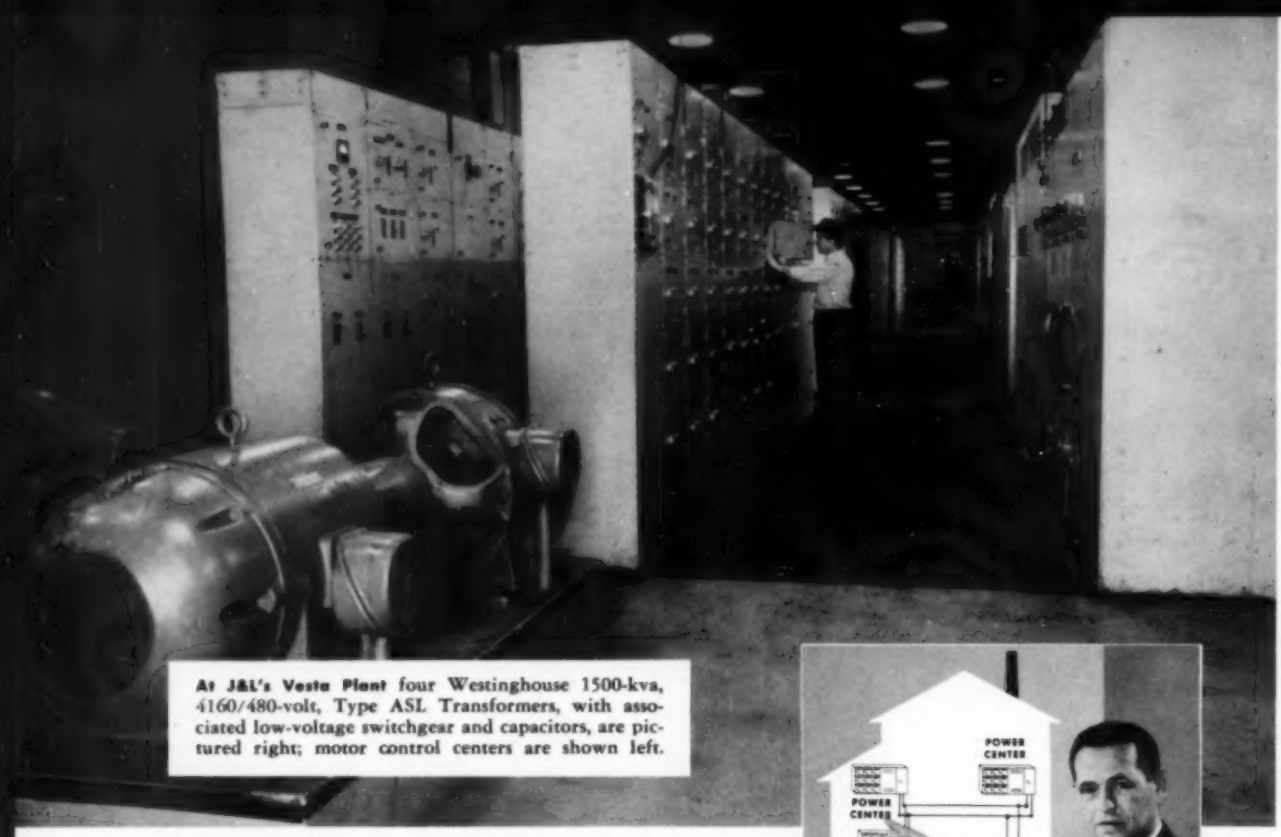
YOU CAN BE **SURE**...IF IT'S

Westinghouse



A Westinghouse D-C Motor and Speed Reducer drive an Atkins medium-spiral densifier at the Robena Plant. This unit provides variable speed operation to regulate the rate at which damp coal is brought up into the chutes.

Westinghouse Gearmotors are compactly built for all types of tight-space mounting problems like this conveyor installation. Precision helical gears in the unit are BPT taper hardened to take the tough load shocks of conveyor duty.



At J&L's Vesta Plant four Westinghouse 1500-kva, 4160/480-volt, Type ASL Transformers, with associated low-voltage switchgear and capacitors, are pictured right; motor control centers are shown left.

In power system planning, Westinghouse Engineers coordinate power-center location to bring correct voltage to the load areas, improving over-all system efficiency, reliability and ease of expansion.

Economy in bringing higher voltage close to the load

Seven Westinghouse Power Centers are used to bring primary voltage into load areas at Hanna's Georgetown Plant. Only 3 kwhr per ton of coal cleaned is the average power consumption here.

Economy of the operation results largely from the advantages in bringing higher voltage close to the load. Better voltage regulation is possible so that power is available to operate each drive motor at top efficiency. Long runs of heavy secondary conduit are eliminated, too, saving considerably in the cost of copper and installation labor.

Factory assembled and tested, all 7 power centers arrived ready for installation. ASL dry-type transformers, used in each power center, provide a greater degree of safety, too. There are no liquids to store or service, or vaults to build.

* * *

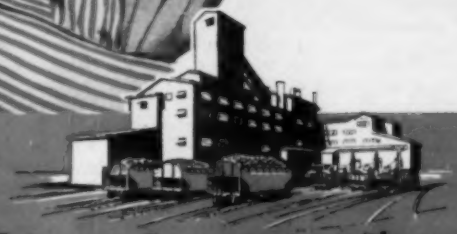
A look at your future in processing coal may point to the need for electrical help. Whether you plan to increase capacity of an existing plant, or to build new facilities for this growing market, call in your local Westinghouse Representative to help in planning equipment needs. He can also supply you with the following literature, or write to Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

Ask for;

New Life-Line "A" Motor	B-6154
Life-Line Gearmotors	B-5645
Westinghouse Speed Reducers	B-5646
Automatic Operations Start with Westinghouse Controls	B-5882
Complete Industrial Control	B-6051
Modern Drives for Modern Coal Mining	B-5619
Dry-type Transformers	B-5920
Control Centers	B-5621
Hi-voltage, Metal-clad Switchgear	B-5282
Preventive Maintenance	B-5477-A

YOU CAN BE SURE...IF IT'S Westinghouse

MP-3033



Something Extra with every Fairmont Preparation Plant

Through coordinated responsibility, Fairmont-built Preparation Plants result in "something extra" which leads to operating economy plus increased separating efficiency to meet the expanding demands of today's coal markets.

When you specify Fairmont, you are assured of . . .

- Coordinated, qualified design, engineering, fabricating and erecting services.
- Independent equipment selection best-suited to meet your specific requirements.
- Pilot crews to aid in the instruction of your own personnel.
- A well-planned installation to take care of today's needs and provide for future requirements.

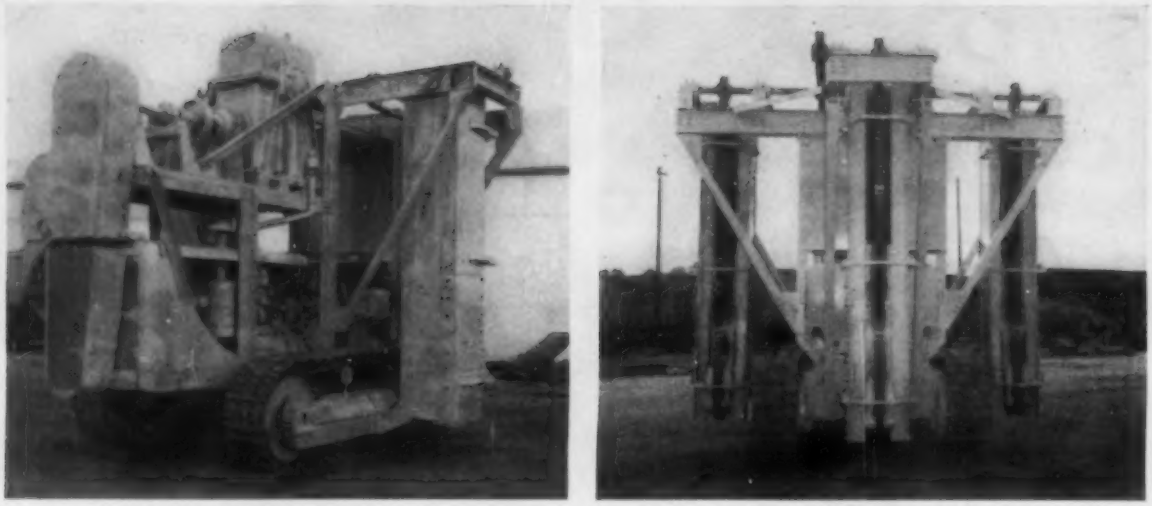
When you have a preparation problem, let Fairmont assume the responsibility of providing a plant that guarantees product uniformity and over 99% separating efficiency through a wide product size range of ⅛" to 10" in any tonnage capacity.

Call a Fairmont engineer!

FAIRMONT MACHINERY COMPANY

FAIRMONT, WEST VIRGINIA

DESIGNERS AND CONSTRUCTORS OF COMPLETE COAL PREPARATION PLANTS USING BOTH WET AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.



MORE PUNCH FOR PINNING COAL—Front (left photo) and rear views of triple-action coal buster reveal rugged construction. Size and multiple pinning action are keys to machine's efficiency.

Bigger, Faster Pit Unit

"EQUIPMENT IS GETTING BIGGER all the time. It's got to be that way."

In those words, a roving official of Sinclair Coal Co., fifth largest commercial bituminous producer in the Nation, recently summed up what he sees as, week after week, he travels over the far-flung operations of his company and its affiliates.

Bigness alone, this official points out, has no real merit in and for itself. For instance, his company never would operate 70-ton trailers simply for the sake of having the biggest trailers anywhere around. But, he explains, bigness and efficiency often are closely knit together, especially in handling massive tonnages of bulk materials such as overburden and coal. And that, he says, is why strip-mining equipment is getting bigger and bigger.

This trend toward more size, greater capacity and higher efficiency reflects Sinclair's relentless search for lower-cost ways to produce coal. Recently, that search has produced a three-place pinning machine, built in the shop at the Tiger mine, Hume-Sinclair Coal Mining Co., Hume, Mo., for use in the pit of a nearby affiliate, Power Coal Co., Montrose, Mo.

Size and multiple action are the keys to efficiency in the big three-place pinning machine built this spring for breaking the 24-in coal seam in the Power pit. Tested first on the relatively soft coal in the Tiger pit, the machine is expected to work even better on the harder Power coal.

The pinning rig is built on a Caterpillar D-8 tractor with a Caterpillar 130-hp diesel engine. But before the men in the Tiger shop actually began work on the machine, they asked Caterpillar engineers whether the D-8 would carry the additional load planned. With a go-ahead from Caterpillar, the Tiger shop started work.

The completed machine, shown in the accompanying photographs shortly before being trucked in June, 1954, to the Power mine, carries three 7,000-lb weights, one mounted on the rear of the D-8 and one on each side. The piercing point at the bottom of each weight is 8 in long, tapering from 5 in at the base to about 3 in at the tip. Weights are dropped simultaneously every 10 sec from a height of 9 ft 5 in. Arrangement of the weights, with side units 10 ft 10 in apart and the rear unit on the center line of the tractor, leaves a trail of pinned holes on 5-ft centers in the wake of the machine.

Power for lifting the weights is taken off the front-end drive of the D-8 through a vertical V-belt drive using six 240 DV belts. Tension is maintained on the V-belts by a six-groove pivotable sheave that can be locked in place with a single bolt. Power is transmitted through a Twin-Disc duplex clutch, Model E-14. One of the clutches transmits power on toward the lifting mechanism. The other clutch acts as a brake, enabling the operator to hold the weights suspended while moving from one spot to the next or while tramming in the pit or elsewhere.

Power continues into a Foote Bros. worm-gear reducer, Type 20-S, with a ratio of 12:1, whence it proceeds via chain to sprockets at the headshafts.

Speeds in the successive staves of power transmission are as follows:

Engine crankshaft, up to 900 rpm
Input to reducer, up to 600 rpm
Worm-gear output, up to 50 rpm
Sprocket output at headshaft, up to 34 rpm

For hoisting the three weights, a total of 110 ft of Baldwin roller chain, 1½-in roller and 2½-in pitch, is used. The chain weighs 12.9 lb per foot. The tail-shaft sprocket, on which the hoisting chain turns at the bottom of the shaft, is mounted on a spring-mounted axle to absorb shock and ease the strain on the chain. The weight itself is hoisted by lifting lugs welded on a single link of the chain. Thus if a lug breaks under strain, a spare link with welded lugs can be inserted in the chain with a minimum of lost time and effort.

Rectangular shafts inside which the weights travel up and down are made of 5/16-in steel plate, welded along the corners except for a 4-ft side panel at the bottom, which is bolted and thus can be removed easily if the weight must be taken out. Steel wearing strips inside each shaft protect the shaft itself from wear. Each shaft is suspended at the top of the rig from a 4-in pin. At the bottom, the shafts rest on non-rigid supporting plates, enabling the shafts to "give" with twists of the tractor frame.

Flat treads 18-in wide now replace the conventional 24-in cleated treads on the tractor crawlers. With flat treads, the crawler now has more effective bearing surface than with the wider cleated treads and, in addition, does not pulverize the coal.

Total weight added to the D-8 adds up to 14 tons, including the weights and pins plus supporting structures, speed reducers, driveshafts and shafts for the three weights. To support this additional weight, Roy Houck, master mechanic at the Tiger mine, had the big standard spring for the D-8 replaced with a box resting in a cradle, as suggested by Caterpillar engineers. The machine trams at 5 mph.

A steel plate above the operator's head protects him from grease droppings and from falling chain, if it should break.

CAT* power since '43–

"GOOD PERFORMANCE ALL THE WAY"

That's what Mike Mazzara says of his Caterpillar equipment in coal-stripping operations for Mazzara Coal Co., McKees Rocks, Pa. He owns six Cat D13000 Engines and seven Caterpillar track-type Tractors. "Best on the market," he states. "We've had nothing but good performance out of all our Cat equipment all the way."

One of his Caterpillar D13000s powers the Lorain 75-D with 1¼-yard shovel, shown here stripping roof coal to get at the good bottom coal underneath. Ground will be backfilled after the coal is taken out.

This Caterpillar D13000 has been on the job since 1943. It moves an average of 150 to 200 tons per hour—about 45 tons for every gallon of low-cost fuel! All Caterpillar Engines can deliver full and *foul-free* power on money-saving No. 2 furnace oil, thanks to their special Caterpillar-built fuel injection systems.

In addition to fuel savings, Caterpillar Diesel Engines can cut your costs in many other ways. "Hi-Electro" hardened crankshaft journals, long-lived aluminum alloy pistons and bearings, really *effective* oil and air filtration—these are just a few features of rugged, reliable Caterpillar Engines that give you *long work life, minimum down time,* with *little maintenance.* And when you need skilled service and genuine factory parts, you can count on your Caterpillar Dealer.

There are Caterpillar Engines and Electric Sets to 500 HP and 315 KW. Your Caterpillar Dealer will help you pick the unit that suits your needs to a "T." When you repower, or order new equipment, specify Cat power. Leading manufacturers of excavators and other mining equipment can supply it in their machines.

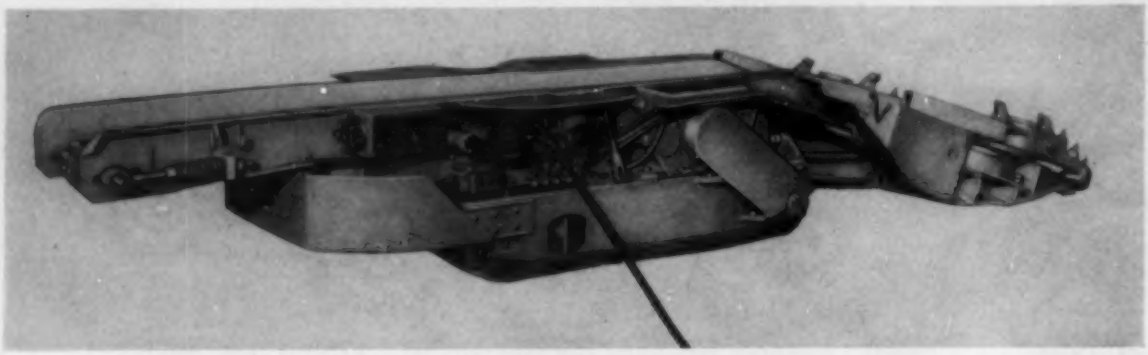
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered Trademarks—®

SPECIFY CAT POWER FOR HIGH-PROFIT PERFORMANCE

EQUIPMENT NEWS



New Loader Designed for Continuous Conveyor Systems (1)

The Long Co., Oak Hill, W. Va., has announced its new Model 88 "Pigloader" as the first loading machine specifically designed for use with the Long "Piggyback" conveyors developed to assure uninterrupted haulage from the face.

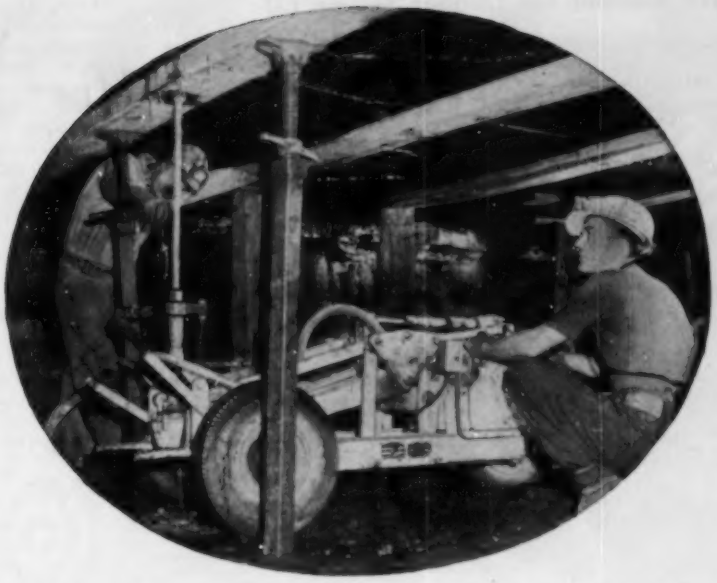
Suitable for operation with either the PT-12 or PT-15 Piggybacks, the crawler-mounted Model 88 Pigloader is a low-height, heavy duty machine capable of continuous high-capacity production and is sturdily constructed to withstand the hard usage imposed by the high-tonnage Piggyback mining system, the maker reports. All machine operations are driven by a single USBM-approved 35-hp electric motor and all drives are mechanical.

Among the features of the new unit cited by the company are the long wheel base with wide tracks that provides high stability and positive operation even in soft coal, extreme maneuverability and simplified operation. Operator fatigue is minimized and efficiency increased, it is pointed out, with a single bank of finger-tip control valves for the hydraulic control of all functions, tramming, raising and lowering of the head and tail and operation of the conveyor chain and gathering arms. The short length of the unit (16 ft), low over-all height (26 in) and narrow width (5 ft 8 in) are combined to facilitate operation in close quarters and low coal, and the Pigloader also facilitates better roof control and better timbering in break-through areas, it is said.

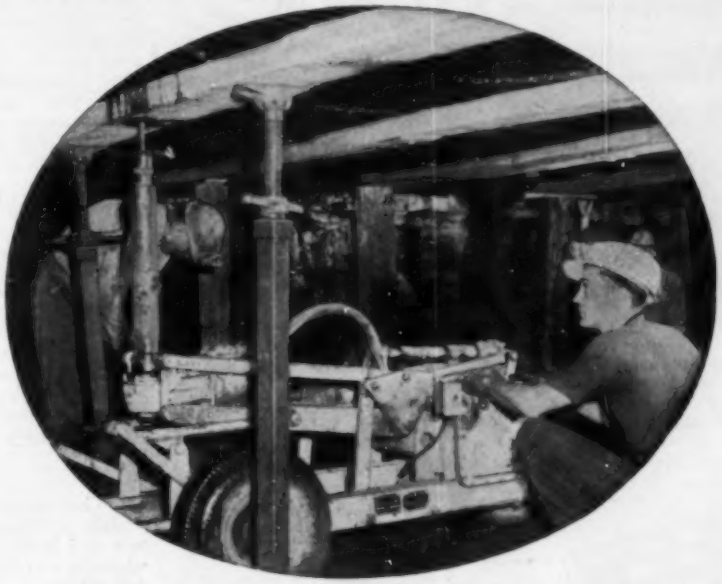
The Pigloader has a rated capacity of 3 tpm, average; 5 tpm, maximum. Tramming speed is 120 fpm and the unit weighs 14,000 lb. Electrical control is non-reversing magnetic with start-stop push buttons and conveyor chain is of heavy duty single-strand design. Circle No. 1 on the postage-free card facing p 132 for full details from The Long Co.

Waterless Roof Drill Offers Dust-Free Operation (2)

A practical answer to the problem of clean, fast roof-bolt drilling is provided by the Holman "Dryductor" air-driven percussion drill, according to the Goodman Mfg. Co., Chicago 9, exclusive seller of the unit in the U. S. In operation, the Dryductor extracts dust and chips as they are made, passes them through the drill and draws them away from the operator and the face via a pipe line to a dust collector. No suction cups, water lines or other devices are required and the hole is ready for bolting as soon as the drill is withdrawn. During drilling there is no dust in the air and since water is not used there is no sludge in the drill hole or water on the mine bottom, the company points out. Hand-held or used with any type of light mounting, the Dryductor can drill up, down, horizontally or at any angle, and a double telescopic stoper leg available in various sizes permits maximum-depth holes with a minimum of hole changes. Both drill and dust collector are approved by the USBM. Circle No. 2 on the postage-free card for complete details from Goodman.



GETS THE WHOLE JOB DONE—IN 3 MINUTES TIME!



Talk about speed! The Chicago Pneumatic RBD-30 Permissible Roof Bolting Unit really has the answer! You can easily wheel it into position, drill hole and set expansion bolt, without repositioning, in 3 minutes flat! And in cases where hole depth is less than 36" you can complete the entire cycle in only 1½ minutes time. Its low 28" overall height and complete portability permit easy entrance and afford effortless operation in low spots.

A telescopic chuck permits 6 inch auger adjustments to conform to roof irregularities. One rugged motor drives both auger and bolt setter. Built-in slip clutches protect the drill and bolt setting motor . . . prevent feed motor from stalling. Available with water swivel and special adapter for low speed spindle and low speed drilling. For more details write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

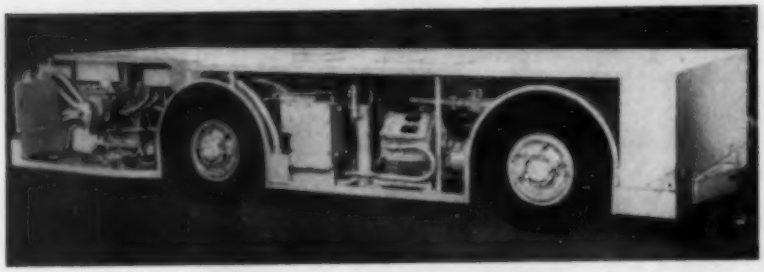
Chicago Pneumatic

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

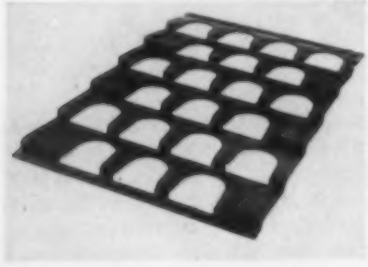
Low-Height Track Cleaner for Thinner Seams (3)

Its new 30-in Canton track cleaner designed for operation in thinner seams incorporates many of the time-proven principles of the 40-in machine as well as various new features of design and construction, according to the American Mine Door Co., Canton 6, Ohio. Among the new features cited by the maker are: hydraulic control, with plows adjustable while traveling without manual action; fluid-drive coupling that uncouples motor if conveyor jams and requires no shear pins or resetting; variable cleaning width from 6 in outside rail to maximum of 54 in from center of rail, with plow wings adjustable while machine is operating; extra wide throat clearance to handle large lumps; drive chains of steel bushed chain for severe service, with adjustment for wear and shortening; accessibility of motor and reducer outside frame; and simplified rail scraper not subject to damage by frogs or guard rails. Mechanical track cleaning with its Canton units costs only one-tenth to one-third of hand methods, and the machines quickly pay for themselves if recovered spillage is salvageable, the company points out. Bulletin 139 with full data from American Mine Door.

Self-Contained Compressors for Air Shooting (4)

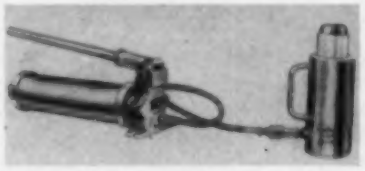


A new portable high-pressure compressor designed for use with the Armstrong Airbreaker tube in breaking out underground coal now is being marketed by the Explosives Div., Olin Industries, Inc., E. Alton, Ill., as the Armstrong Coalbreaker on a lease or purchase basis. The 6-stage compressor is powered by a 50-hp motor and provides pressures up to 12,000 psi. It is available in two models, semi-portable (non-self tramming) and full-portable (self tramming), each with either wheel mounting for track use or rubber-tired wheels for trackless mining. The units weigh 16,000 and 20,000 lb, respectively, and are as low as 35 in high, 63 to 76 in wide and under 14½ ft long. Featuring full flexibility, the semi-portable model was designed for convenient location underground to eliminate excessive air-transmission lines, while the fully portable unit, powered with a 10-hp permissible motor and equipped with 350 ft of cable, is intended for operation in the working sections either positioned back of the face or as a part of the regular mining cycle. Economical operation, increased safety, on-shift shooting without delays, easy loading and variable coal sizes produced, are among the features of the Armstrong Coalbreaker system cited by the company. Full data from Olin.



SCREEN CUTS BLINDING (5)

Hendrick Mfg. Co., Carbondale, Pa., offers a flanged lip screen for vibrating and shaking screens said to practically eliminate blinding. Key to the screen's non-blinding success is its tapered shape of openings and steps of openings that provide far better separation, the maker points out. Hendrick flanged lip screens are furnished with openings varying from 0.010x025x½ in to 10⅝x11⅝x13 in. Details from company.



50-TON HYDRAULIC JACK (6)

A new 50-ton remote-controlled hydraulic jack announced by Templeton, Kenly & Co., Broadview, Ill., consists of a hydraulic ram, a high-pressure connecting hose and a pump. It is designed for use in confined quarters under loads with minimum clearance and in other locations where the additional safety and convenience of remote operation is desirable. The ram has a minimum height of 10½-in and a 5½-in lift. For faster operation, the pump has an automatic switchover which permits rapid positioning of the unloaded ram and low-speed powerful pumping when the ram lifts the load. A safety bypass valve prevents over-loading. Full details from company.

MULTIPLE-BELT DRIVE (7)

New Browning-type "Poly-V" (Raybestos-Manhattan, Inc., trademark) drives are multiple V-belts molded as a single unit, running on matching sheaves and combining the advantages of V-belts with the simplicity of flat belts, the company says. Among the advantages cited are the elimination of the belt-matching problem and utilization of a space-saving drive with narrower sheaves, shorter centers, higher capacity and all members "in match" for constant and continuous uniform pull across full belt and sheave width. Bulletin 2098 with complete design and application data offered by the Browning Mfg. Co., Maysville, Ky.

B.F.Goodrich

Universal tires roll 125,000 miles under 40 tons of coal

THE Colonial Coal Company of Madisonville, Kentucky, hauls coal from the stripping pit to the mine tipple. Forty tons is the weight of the average load carried by the company's 20 trucks over rugged gravel and cobblestone roads. The trucks roll as many as 60 hours a week—and every one is equipped with B. F. Goodrich Universal tires.

Some of the Universal tires now in use have seen 125,000 miles of this severe service. Colonial reports Universal tires can be recapped as many as three times. One reason for such outstanding performance records is the Universal tread. It is specially compounded to resist snags and cuts. The husky, non-directional cleats resist skidding and slippage, pull through the roughest going faster and easier.

Under the tread is the patented B. F. Goodrich nylon shock shield. Layers of strong nylon cords stretch together under impact to protect the tire body from smashing road shocks. You save 4 ways because of this protection: (1) more original hours of service (2) more recappable tires and more hours of service per recap (3) increased bruise resistance (4) less danger of tread separation.

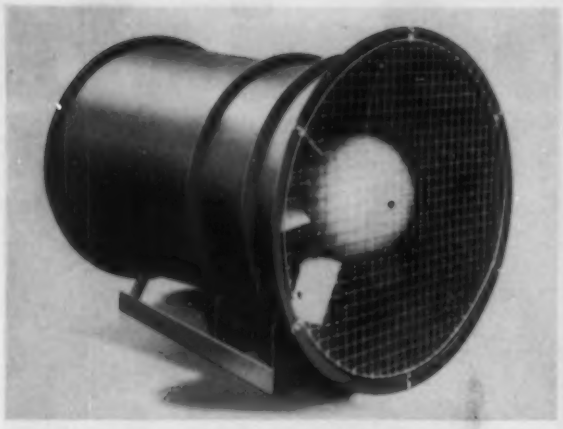
Join the growing list of mine operators who report longer service at lower cost with Universal tires. See your B. F. Goodrich retailer today. The address is listed under Tires in the Yellow Pages of your phone book. Or write *The B. F. Goodrich Company, Tire and Equipment Division, Akron 18, Ohio.*

"UNIVERSAL TIRES are better than any other make of tire I know," says Everett Offit (above), driver for Colonial Coal Co. This company averages over 5,400 hours of service from BFG tires.

SHASTA COAL CORP., Bicknell, Ind., is another user of B. F. Goodrich tires. "We like the Universal tread over other treads," the company reports. "It holds the road better." (Center Rib Universal is shown at right.)

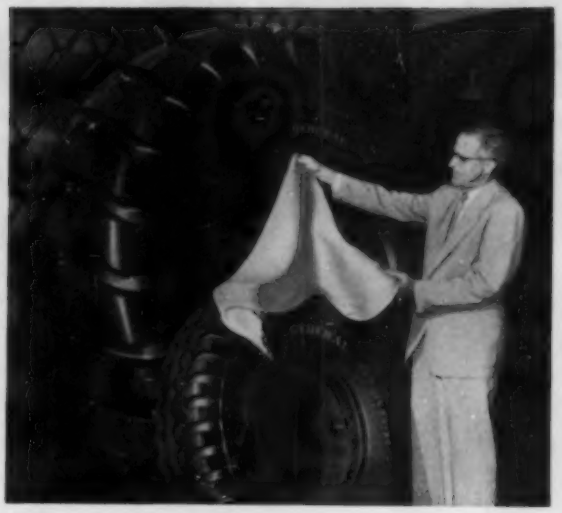
Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER



Mine Fans Designed for High Efficiency (8)

A new 6F Series "Aerodyne" fan available in various sizes for mine ventilation up to 5-in water gage has been announced by the Jeffrey Mfg. Co., Columbus 16, Ohio. Designed to combine low cost with high efficiency, the portable 6F Series Aerodyne is a self-contained unit that needs no bearing alignment after installation, the maker says. The fan features universally adjustable blades made of cast-aluminum alloy mounted on a solid aluminum hub, with flange-mounted antifriction bearings, and is available with different le gths of expansion discharge for varying duties. The new 6F Series has an overhung drive and fan wheel and can be belt-driven up to 125 hp, or to a higher horsepower with a direct-connected drive. Full details from Jeffrey.



More Strength for Off-Road Tires (9)

"Nygen" fabric, said by the company to be the strongest ever devised for tire carcass construction, now is being used in the manufacture of all giant tires produced by The General Tire & Rubber Co., Akron, Ohio. Used previously in passenger car and truck tires, Nygen, a specially treated cord, now is available in the company's line of off-the-road tires in sizes ranging from 12.00x20 to 27.00x33. According to the company, the resilient strength of Nygen resists impact breaks and bruises from the power of earthmovers working at high speed in the roughest terrain. In addition to its load-carrying and shock-absorbing qualities, the Nygen off-the-road giant is particularly well-suited for vehicles engaged in strip mining and similar work because of its water-resistant features, it is said. Data from company.

New 3-Cu Yd Shovel (10)

New Model 71-B 3-cu yd shovel (left), readily convertible to dragline, clamshell or lifting crane, has been developed by Bucyrus-Erie Co., S. Milwaukee, Wis., to complement its line of individually designed crane-excavators and is said to incorporate the basic engineering features and field-proven advantages of the company's general-purpose excavators. The major features cited by the maker include: positive twin-rope crowd with rectangular inside dipper handle; strong light boom; fully independent boom hoist; full air control (not just air assist) except for drum brakes and swing and propel jaw clutches; torque-converter drive (also available without torque converter); one-piece cast-steel revolving frame; choice of four A-frames; 12 conical hook rollers; four optional crawler mountings; and steering clutches and friction digging brakes spring-set and air-released. The 71-B is powered by a 6-cylinder GM diesel engine equipped with a Torcon torque converter and features a 27-ft shovel boom of welded structural steel. Full data from Bucyrus-Erie.

"PACKAGED" MAGNETIC POWER (11)

New self-contained magnetic pulley-type separation unit manufactured by Magnetic Engineering & Mfg. Co., Clifton, N.J., in both electro-magnetic and permanent (Alnico non-electric) designs, is "packaged" in stationary or portable st les, horizontal or inclined, open or fully enclosed, depending on requirements. A new feature of the permanent magnetic type is Memco's recently developed "radial design" which, according to the maker, permits the ferrous material to bridge the magnetic gap, providing extra-strong cross-pole pull through magnet placement perpendicular to the pulley circumference. Catalog 602-4 describing the full line is available.

WET DUST COLLECTOR HANDLES PROBLEM DUSTS (12)

New Pangborn Type "CW-1" centrifugal wet dust collector was developed, the company says, for those dust-control problems which cannot be solved with cloth-type collectors, such as: (1) high temperature or moisture; (2) explosive or combustible dusts; (3) corrosive, highly abrasive and/or obnoxious dusts; and (4) combinations of the foregoing. Designed to handle problem dusts safely but efficiently, the Type "CW-1" collector is of counter-current design (air flow counter-

New O-B Bail Type Units
Go up easy....
and stay put!

BOTH ¾" AND ⅝" SIZES AVAILABLE

- You can now enjoy several new patented features with O-B Bail-Type Shells & Plugs that assure faster, easier installation.
- Both the ¾" and ⅝" units are factory-assembled with shells and plugs in correct relation to each other . . . so you can fit them easily into minimum size holes.
- New O-B design offers you further savings by eliminating costs for upset ears on bolts or other auxiliary devices to support shells during installation.
- Maximum expansion of both size units provides a holding power that exceeds the breaking strength of roof bolts and also assures the greatly improved holding necessary in soft material.

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Feeder and Trolley Materials • Control Materials • Trolley Shoes
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Free copies of Special Bail-Type Roof Bolt Issue are still available. Mail requests to Ohio Brass, Mansfield, Ohio.

4494-M

"TIMKEN® bearings on our 300 Sanford-Day mine cars have gone 21 yrs. without a failure"

. . . says Clover Fork Coal Company

TWENTY-ONE years of the pounding a mine car has to take and not one bearing failure! That's the impressive record Timken® tapered roller bearings have racked up for the Clover Fork Coal Co., Harlan County, Kentucky, on the axles of its 300 Sanford-Day mine cars. This record is all the more incredible because the going is even rougher than usual for these mine cars—they have to be lowered down a 900 foot incline to reach the tipple.

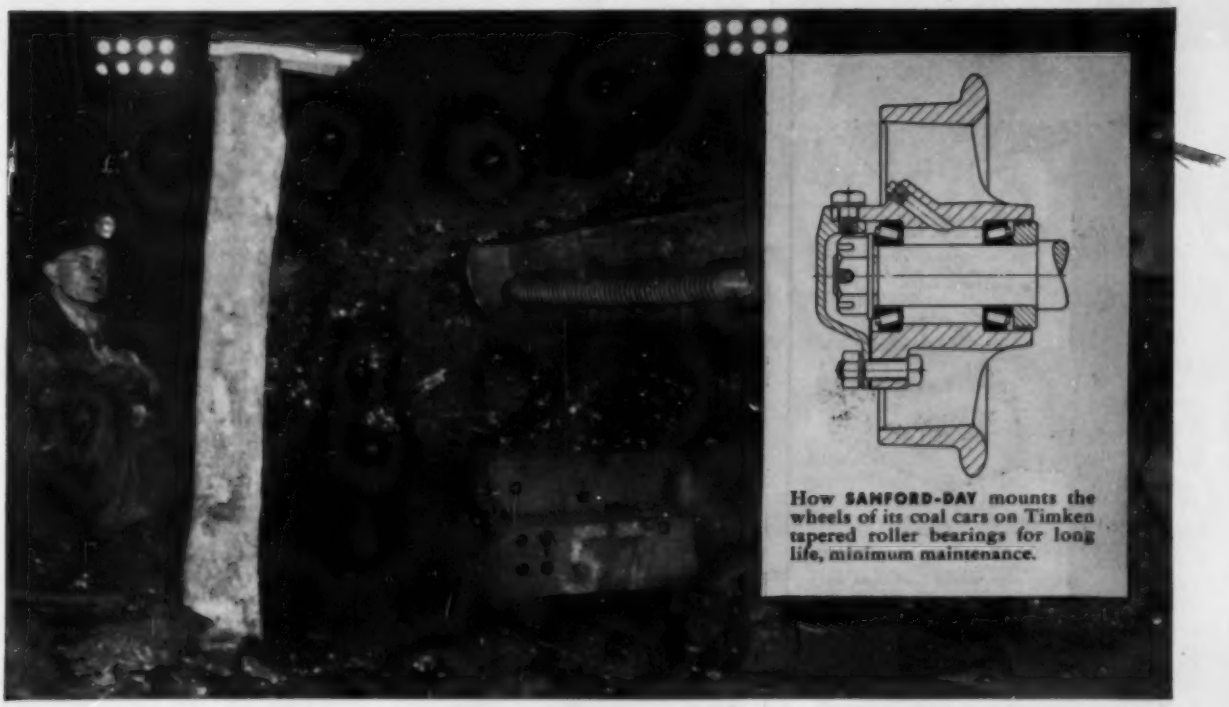
What's the secret of Timken bearings' long life and trouble-free performance?

Greater resistance to shocks is one answer. Special steel made in our own mills is case-hardened to provide a wear-resistant surface over a tough, shock-resistant core. Timken bearings take the abuse a mine car regularly gets with minimum time-out for maintenance and repair.

Another reason for Timken bearings' long life is their true rolling motion and smooth surface finish. There's practically no friction. It's easier to start cars. More cars can be hauled with no increase in power. And full line contact between rollers and races gives Timken bearings extra capacity to handle the heaviest loads. Their tapered design enables them to take radial and thrust loads in any combination.

Timken bearings require less lubrication. Closures are more effective because Timken bearings keep hubs and axles concentric. Lubricant stays in—dirt and moisture stay out. So for longer life, less friction, minimum maintenance, always specify Timken bearings on the mine cars you buy. Look for the trade-mark "Timken" on the bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **SANFORD-DAY** mounts the wheels of its coal cars on Timken tapered roller bearings for long life, minimum maintenance.

IT'S TIMKEN BEARINGS FOR VALUE!

To get the best value in bearings you may find this simple formula helpful:

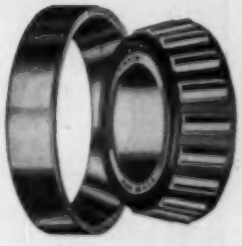
$$Value = \frac{quality + service + public\ acceptance}{price}$$

Obviously a big advantage *above* the line gives you more value than a small one *below*. No other bearing can match the uniform high quality, engineering and field service and overwhelming public acceptance you get with Timken bearings.

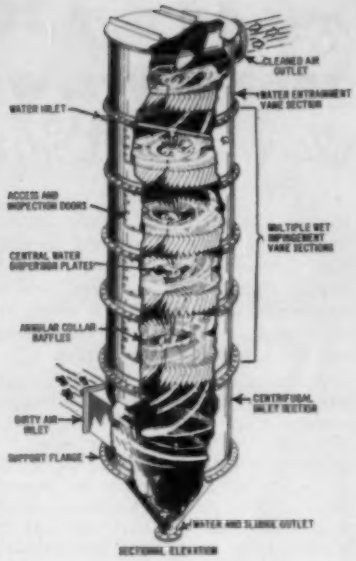
TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬭ AND THRUST →⬭← LOADS OR ANY COMBINATION →✳←



current to water flow) and tower-type construction, and consists of multiple wet vane sections and a final water-entrainment vane section. The diameter of the collector varies with air volume handled and the number of wet vane sections is governed by application requirements. Water enters above the top wet vane section and flows downward or counter to the upward flowing air, entering through the lower tangential inlet. The patented vane design provides greatly increased impingement surface and imparts vigorous, centrifugal action to both the air and water to produce thorough intermixing, with increased capacity in reduced space and no channeling, it is said. Water and dust are discharged as sludge from the lower cone, and clean air from the air outlet at the top. After clarification in settling tanks, water may be recirculated. Specifications and application information from Pangborn Corp., Hagerstown, Md.

TRUCK TIRE ADDS MILEAGE (13)

A totally new design of heavy-duty truck tire featuring improved performance and significant economies has been announced by the Dunlop Tire & Rubber Corp., Buffalo, N. Y. Mileage appears to be at least one-third above that of existing top-grade tires, according to extensive road tests under extreme conditions of overloading reported by the maker. Major design innovations listed by the company include: a special mold design that permits tire tread to flatten under inflation without the usual deformation; elimination of excess rubber in tread shoulders, reducing tire-running temperature 10 deg; new Super Cordura rayon cord of superior tensile strength; plus an improved carbon black for better abrasion resistance and tread wear. Full details from company.

PORTABLE DRILL RIGS (14)

New portable drill rigs introduced by Drilling Accessory Mfg Co., Dallas, Tex., are designed for fast blasthole and water-well or core drilling with only minor adjustments required for each operation. The units are available in two sizes, for rated capacities of 1,250 and 2,000 ft of 2⅜-in drill pipe, respectively. Among the features cited by the maker are standardization of air clutches in the drums; use of hydraulic torque-converter coupling and auxiliary transmission on the mud pump; all chains and bearings operating in an oil bath, with all chains the same size to cut parts cost; and similar uniformity for the hydraulic pistons and all ring gears and pinion. Standardization on parts provides not only economy but also greater convenience, especially where the units are used in extremely isolated locations or abroad, the company points out. Bulletin available.

CABLE ELECTRIC HOIST (15)

Its new cable Quik-Lift electric hoists are available in capacities from 500 to 4,000 lb, with a choice of lifting speeds and types of suspension to answer the need for a fast, flexible unit on many industrial applications, according to the Coffing Hoist Co., Danville, Ill. In addition to offering strength and long life for heavy-duty service, the company reports, the new hoists provide push-button control; large, separate load and motor brakes; foolproof limit switch; and the new Coffing positive-lock safety hooks for extra protection. Bulletin CQ with full data from Coffing Hoist.

PRESS-FIT MILL BEARINGS (16)

The recently announced Link-Belt line of "Mill Bearings" has been augmented to include pillow blocks with heavy-duty self-aligning roller bearings for press fit on shafts. As with other Link-Belt mill bearings, the new series LPK7800F bearings have steel split housings, and they

Leschen engineers tell you how to determine

Proper Use of Wire Rope with Wire Rope Core

First, what is it? It is a completely metallic rope made with a separate wire rope as a core, instead of the usual fiber core.

Why is it used? The steel core resists extreme pressure of individual strands on the core under very heavy loads. Here, a Red-Strand steel core rope substantially outlasts a fiber core rope. The extra steel in the core increases rope strength and safety by 7½%, compared with wire rope with fiber core. For occasional heavier loads this eliminates time and expense of changing sheaves, blocks and equipment to suit a bigger fiber core rope.

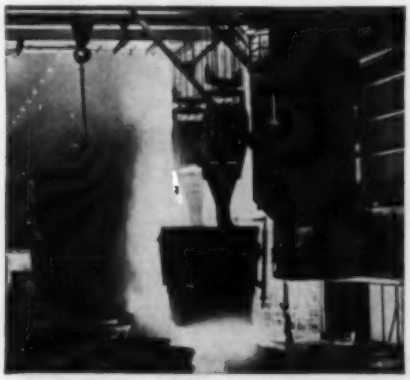
Red-Strand steel core rope answers the problem of crushing when rope is spooled in multiple layers on small diameter drums and winches—or when heavy loads are dragged or pulled. It also resists the damaging effects of excessive heat.

Where is it used? For extra strength and to resist heavy load pressure: on shovel and draglines—for drag, hoist, crowd and frequently boom ropes; on dredges, trench hoes, cranes and similar heavy duty equipment. To resist crushing: on bulldozers, scrapers, coal cutters, coal loaders, logging, arch and choker lines, and on rotary drilling lines. To resist excessive heat: on hot ladle cranes.

Which make should you use? Red-Strand steel core wire rope is highly recommended by its users for its higher-than-rated quality and longer-than-expected service. That saves money.

What's the next step? Talk to your Leschen distributor or Leschen field man. They're well qualified to answer your specific questions about Red-Strand steel core wire rope—or to help solve other wire rope problems. That means profit for you.

Severe stress, pressure and crushing occur on wire rope jobs like this and on rotary drilling drums and winches. On these jobs it pays to use higher-than-rated quality Hercules Red-Strand wire rope with wire rope core.



Where tons of molten steel are to be lifted by wire rope, great strength and resistance to intense heat are required. Here Hercules Flattened Strand wire rope with wire rope core delivers much longer-than-expected service.

Hercules Red-Strand wire rope made by

LESCHEN WIRE ROPE DIVISION

THE WATSON-STILLMAN COMPANY

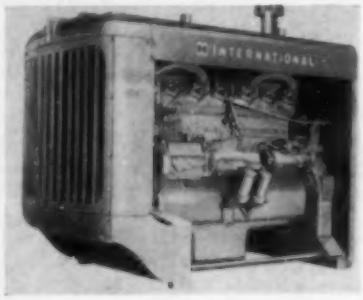
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)

St. Louis 12, Missouri

are available in a bore size range of 3.1496 to 7.4803 in. Press fit of bearings on machined shafts assures positive concentric mounting while locknuts and lockwashers assure positive location, the company points out. With shafting machined as recommended, full capacity rating of the self-aligning, self-contained double row roller bearing is assured, it says. Full data in Book 2565A offered by the Link-Belt Co., Chicago 1.

RUBBER-TYPE ENGINE DRIVE ABSORBS MISALIGNMENT (17)

Availability of "Rubber Block Drive" for general use on powered industrial equipment has been announced by Twin Disc Clutch Co., Racine, Wis., and Rockford, Ill. A special-type drive developed primarily for Twin Disc torque converters and disconnecting fluid power take-offs, and now standard on them, it provides for the absorption of both angular and parallel misalignment. Although Twin Disc rubber block drive is generally mounted to absorb both angular and parallel misalignment, it can be easily adapted to form a piloting-type coupling to handle angular misalignment only, the company says. The drive is offered in four sizes at present and details of its adaptability to any-type powered equipment are available from Twin Disc.



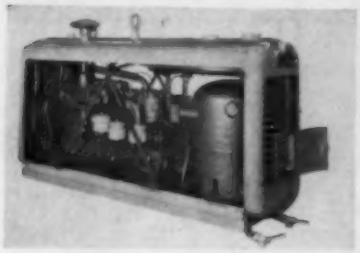
203-HP POWER UNIT (18)

The new UD-1091 diesel power unit, largest in International Harvester's seven-model line, has been announced to replace the UD-24 unit. The engine produces 203 intermittent horsepower or 162.4 continuous horsepower at 1,400 rpm, and as a power unit, 190 and 152 hp, respectively. With the same piston displacement and dimensions as the UD-24, the UD-1091 offers a net maximum torque of 793 lb at 1,000 rpm, as compared with 775 lb at 800 rpm for the UD-24. The entire unit is skid mounted and is available with various attachments and gear ratios. Full details from International Harvester Co., Chicago 1.

1-YD SHOVEL-CRANE (19)

New Koehring Model 405 excavator in the 20-ton lift class features a completely modern design, with only two major shafts in the upper machinery for all applications. A high-capacity machine, the 405 can be lightened for road travel because crawlers and counterweights are easily removed, and it is equipped with quick-acting automatic traction brakes. Crawler-

mounted, the 405 now is available with five attachments, with the shovel and hoe designed for buckets of 1 cu yd; the size of clamshell and dragline buckets depending on weight of material; and the crane lifting up to 20 tons. The unit will travel easily on grades up to 30% and offers various standard Koehring features. Details from the Koehring Co., Milwaukee 16, Wis.



COMPRESSOR SAVES SPACE IN TRUCK MOUNTING (20)

After an absence of several years, increased demand has put the 105-cfm "Utility" compressor back into its Airmaster line, reports the Le Roi Co., subsidiary of Westinghouse Air Brake Co., Milwaukee 14, Wis. The new unit offers several improved features, including better air cleaning and cooling through the use of oil-bath air cleaners and a pressurized cooling system. While using the same basic engine as the Le Roi 105 portable, the Utility compressor is built up under one housing, including an upright air receiver; measures 25x82 in; and is lighter and more compact than the standard skid-mounted 105 unit. This space-conserving feature makes the Utility suitable for mounting crosswise behind a truck cab while leaving plenty of extra room for other equipment and materials, it is said. Details from Le Roi.

WIDER USE FOR SMALLER-SIZE BRAKE-TYPE MOTORS (21)

Short over-all length, one of the features of its new integral Brakemotor, is made possible by utilizing the motor end bracket as an integral part of the brake and permits its use in many applications formerly prohibited by space limitations, according to the Louis Allis Co., Milwaukee 7, Wis. The units utilize disk brakes and are available in NEMA motor frame sizes from 203 to 326, with brakes designed to furnish maximum continuous-duty torque from 3 ft-lb in the smaller sizes to 50 ft-lb in the largest. Various special Brakemotor electrical and mechanical modifications are also available. Among other features cited by the maker is an external wear indicator that eliminates cover removal and constant brake-lining inspection, and shows that the brake is operating properly at each engagement. Bulletin 1550 with details from company.

IMPROVED PILLOW BLOCKS (22)

Improvements in the Ahlberg light-duty ED series of regular and rubber-insulated ball-bearing pillow block and flange mountings include double set-

screws for more permanent shaft locking and a standard gun-type of lubricant fitting instead of the former ball-check oil fitting. Featuring economy in light-duty application, the series includes the ED pillow block, the FED flange, and the EDR rubber-insulated pillow block with rubber mounting. Bulletin 7149-A with full data from the Ahlberg Bearing Co., Chicago 32.

PORTABLE COMPRESSOR (23)

A new 2-wheeled portable compressor with a capacity of 125 cfm has been announced by Gardner-Denver Co., Quincy, Ill. The new Model WH-125 features a 2-stage water-cooled "W"-type compressor driven by either gasoline or diesel industrial-type engine operating at moderate speed. Water-cooled compressor cylinders limit operating and discharge temperatures when the weather is hot, and in cold weather, warm water from the engine can be circulated through the compressor water jackets before the clutch is engaged to warmup and fully lubricate the compressor, the maker point out. Details from Gardner-Denver.

Equipment Shorts You'll Want to Check

(24) pH CONTROLLER—A new electronic indicating pH controller announced by the Bristol Co., Waterbury 20, Conn., features a newly developed high-torque, jeweled, millivoltmeter-type movement, an easy to read 7-in mirror scale, and a dust- and vaporproof case. The unit will actuate a wide variety of final control devices, permitting pH control with any type of reagent, whether liquid, gaseous, or solid. 36-p Bulletin Q1304 provides complete specifications.

(25) PLASTIC AIR HOSE for use with pneumatic tools, new "Bostrene" air hose is not only lighter in weight and more flexible, but it is flame and abrasion resistant as well, the maker says. Colored a bright red to permit easy identification, it is available in ¼- and ⅜-in I.D. for pressures up to 120 psi. Details from Boston Woven Hose & Rubber Co., Box 1071, Boston 3, Mass.

(26) IRON ALLOY—A new, extremely hard, abrasion-resistant iron alloy, Tisco 150-Y, has been announced by the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., to combat abrasion in its severest forms. Tisco 150-Y can be heat treated to 700 Brinell and field tests have indicated a life expectancy of two to six times other alloys used for the same purposes, the maker reports.

(27) DIESEL STARTING—All-weather direct electric starting with newly-developed glow plugs now is available for the Caterpillar D4 track-type tractor. The completely automatic push-button starting unit, which has been offered for some Caterpillar engines and electric sets, provides positive starting with fingertip con-

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Strip Mining

USE THE CABLE THAT FITS THE JOB!

THE CABLE...

Hazacord Type SH-D Portable Cable

Ability to withstand extreme mechanical abuse and electrical stress is vital for long operational life in portable cables for shovels and drag lines. Hazacord Type SH-D Portable Cable combines the greatest electrical safety with maximum mechanical strength for long life and minimum outage in installations up to 15,000 volts.

Hazacord SH-D cables are protected by the mold-cured Hazaprene ZBF sheath with tire-tread toughness for extra mechanical strength. The copper shielding braid over each conductor, when properly grounded, equalizes electrical stresses and drains off all capacity-charging currents, insuring safety in handling. Grounding conductors in the interstices contact the copper shielding braid, providing an adequate low resistance ground for the equipment.

For information on this widely used design or on other portable cables, consult your Hazard representative or write Hazard Insulated Wire Works, Division of The Okonite Company, Wilkes-Barre, Pa.

HAZARD

insulated cables

2137

POWERHOUSE

AT STEAMBOAT SPRINGS

High up in the mountains of Colorado, 12 miles from Steamboat Springs, this Caterpillar D8 Tractor is removing overburden at a coal-stripping operation of Osage Coal Co.

Even in this "dead" material, the scientifically curved moldboard of the No. 8A Bulldozer creates a rolling action for heaping, fast-moving, *high-profit* blade loads. The D8 and matching 'dozer have the strength and stamina to work in frozen earth, and to take the equipment-busting knocks of work around rock. Yet this big yellow bruiser treads lightly on soft ground. It can work through quick thaws and spring mud because its broad tracks keep gripping under all load conditions. The Cat* Diesel Engine in the D8 delivers its full horsepower *at the bulldozer blade.* It will not smother under heavy loads, because it develops maximum "push" when lugging down, even in this thin mountain air.

The experience of Osage Coal Co. goes back to an old gas-powered Caterpillar Auto Patrol, which is still in service. In addition, they own a D7 and a D6 Tractor. "Our Cat machines are doing good work for us," states G. E. Ralston, superintendent.

You, too, can expect years of good work from Caterpillar equipment. Ask your Caterpillar Dealer to demonstrate the rugged tractor-'dozer team that's built to do most work for *you* at lowest cost. And count on your dealer for fast, skilled service and genuine Caterpillar parts.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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Please send me catalogs or further information about the items from the Equipment News Section whose numbers are circled. (September, 1954)

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3	7	11	15	19	23	27	31	35	39	43	47	51	55
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USE THIS CARD

trol from the D4 Tractor seat, even in below-freezing weather, the company says. The glow plugs, which actually serve as heating elements, prevent battery life from being drained away through prolonged cranking during cold months. Details from Caterpillar Tractor Co., Peoria, Ill.

(28) UNIT HEATERS—A new series of horizontal unit heaters designed to provide comfortable outlet temperatures on high-pressure, high-temperature steam systems has been added to the Herman Nelson line by the American Air Filter Co., Louisville 8, Ky. The new propeller-fan units can be used on steam systems of pressures up to 125 psig, with capacities ranging from 385 to 5,430 cfm (70-deg air), 17,400 to 228,000 Btu/hr. They also are suitable without modification for forced hot-water heating systems. Bulletin 700-A5 with data from company.

(29) EXCAVATOR DRIVES — Torque converter-engine combinations now are available as optional equipment on certain models of Bucyrus-Erie excavators. Using high-speed torque converters more economical in physical size, weight, efficiency and cost, the combinations provide maximum (stalling) torques from 200 to 225% of full-load torques of straight friction drive for a given excavator. Resultant smooth, steady power over the entire working cycle pays off in higher production, and the cushioning effect of the torque converter protects the machinery and engine from the shock loads, adding to equipment life and reducing engine wear, it is said. Details from Bucyrus-Erie Co., S. Milwaukee, Wis.

(30) HOSE FITTINGS—New socketless fittings and hose kit, announced by the Aeroquip Corp., Jackson, Mich., includes 17 popular fitting sizes and 24 ft each of hose in both the ¼- and ⅜-in sizes. Designed for shops servicing trucks, autos or earthmoving equipment, the kit permits reductions in inventory by dispensing with costly stocks of ready-made hose lines. Aeroquip socketless fittings and hose are easy to install, need no clamps or sockets and may be used for all low- and medium-pressure fuel, air, water and oil lines, it is said.

(31) INEXPENSIVE FACE PROTECTION for wearers of safety hard hats and caps is available with the new Bullard Lumerith acetate clip-on and swing-back type face shields that have large, clear tough, Lumerith windows for effective eye, face and throat protection. For occasional use, the Clip-On model is secured by tight gripping, spring steel slips that require no drilling of holes or attachments. For frequent use, the Swing-Back model attaches to a safety hard hat by drilling and bolting to brim and swings easily to any desired angle or overhead position when not in use. Details from E. D. Bullard Co., San Francisco 3.

(32) ELECTRICAL CONTACTS — The efficiency of Gibsiloy UW-8 copper-tungsten contacts has doubled the life of the Size I contactor used in a Size I oil-immersed starter of one manufacturer and withstood the severe and confined arcing involved with very little erosion, the company says. It recommends them as electrical contacts for tap changers, other starters and oil-immersed apparatus. Details from Gibson Electric Co., Pittsburgh 21.

(33) HEAVY-DUTY CUTTERS in the new "Hardy" line for cutting concrete reinforcing rod, hard bolts, chain and high-strength steel strand and guy wire feature increased leverage and use of new alloys and heat treatment to give long service life with no appreciable increase in weight, the maker says. Available in capacities up to 9/16-in diameter. Details from Interstate Drop Forge Co., Milwaukee, Wis.

(34) TRUCK WINCHES—New 7,000-lb truck winches for standard and low mounting, announced by Gar Wood Industries, Inc., Wayne Div., Wayne, Mich., are the standard-mount winch Model 7S designed for installation behind truck cabs; and the low-mount winch Model 7L, which mounts in front or at rear of truck chassis, or back of cab, and permits the entire truck platform to be used for the payload. Details from Gar Wood.

(35) INTERCOMMUNICATIONS SYSTEM requiring no cables or installation, the six-station Talk-A-Phone LCM-8806 has a selector which enables each unit to transmit to any of the six separate channels and receive calls on any channel it selects, with as many as three separate conversations being carried on simultaneously. The maker suggests the system particularly for instant or temporary installation, since the unit plugs into the conventional electric outlet and no preparatory installation work is necessary. Details from Talk-A-Phone Co., Chicago 2.

(36) POWER OUTLET—Rowan Type 620-A3GX oil-immersed power outlet, designed to facilitate easy connection of portable equipment, has a manually operated, mechanically interlocked switch handle and plug that prevents the insertion or removal of plug while switch is in the on position, thus preventing an accidental shutoff of circuit power. Features cited by maker include sealed-off terminal compartment and safety jack; provision for padlocking the switch in off position; top and bottom conduit entrance; and manually operated disconnect switch with quick make-and-break mechanism. Details from Crouse-Hinds Co., Syracuse, N. Y.

(37) TWO-WHEEL HAND TRUCK which embodies a hydraulic lift capable of raising loads of ¾ ton to a height of 36 in is called the "Shop Caddy" and is designed as a convenient, safe means of lifting and moving heavy loads around a shop or warehouse. Other units with capacities up to 1,000 lb and lifting heights up to 78 in are available. Literature from Precision Equipment Co., Chicago 41.

(38) SHOVEL-LOADER—New Model TL-12 4-wheel-drive rubber-tired "Tracto-Loader" with a 1-cu yd bucket announced by the Tractomotive Corp., Deerfield, Ill., is equipped with rear-wheel power steering, a clutch-type transmission with four speeds in each direction, and a torque-converter drive with a 3:1 torque multiplication ratio. Normal maximum dumping height is 8 ft. Bulletin 946 with details offered.

(39) OILING VALVE—A new heavy sight-feed valve designed to control dispensing of liquid volume and permit visual observation of flow in pressure or gravity oiling systems has been announced by Oil-Rite Corp., Manitowoc, Wis. Available in ¼- to ½-in pipe threads, the new valves are equipped with needle valve control and regulate oil flow from full flow to complete shut-off with smooth, easy hairline adjustment. The sight chamber is large for

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easier observation of oil flow and is vented to prevent air binding, it is said.

(40) ELECTRIC SETS—New higher continuous ratings for Cat D337 and D326 engines and electric sets in both self- and externally-regulated types have been announced by Caterpillar Tractor Co., Peoria, Ill. These engines now are available for continuous operation 24 hr a day at 1,800 rpm. Externally-regulated D337 electric sets are rated at 110 kw for 24-hr and 124 kw for 12-hr duty; externally-regulated D326 electric sets at 85 and 95 kw, respectively. Similar operation for self-regulated electric sets is available at an output of 103 and 117 kw for D337 electric sets; 80 and 90 kw for D326 electric sets.

FREE BULLETINS AVAILABLE

(41) POWER TRANSMISSION, CONVEYING, ETC.—New 340-p standard products Catalog 950, issued by Link-Belt Co., Chicago 1, is designed to permit easy and rapid selection of such Link-Belt products as: chains and sprockets; enclosed gear drives; ball and roller bearings, pulleys, gears, clutches and couplings; components for screw, belt, and oscillating conveyors and bucket elevators; and engineered products, such as, vibrating screens, car spotters, etc. Full specification data, capacity charts, tables of pre-selected assemblies and ready identification of stock products are among the book's features to simplify selection and ordering.

(42) CONVEYOR BELTING, TIRES, HOSE—Booklet offers facts and case histories on Du Pont's "Cordura" high-tenacity rayon, said to be a rugged, durable fiber with a tensile strength equivalent to 70,000 psi, and its use for conveyor belts; heavy-duty, off-the-road tires; water hose, drain hose, steam hose and air hose; and V-belts in various mines and quarries. 26-p Booklet H-6296 from Pub. Rel. Dept., E. I. du Pont de Nemours & Co., Wilmington 98, Del.

(43) DIESEL-ENGINE LUBRICATION—Written for everyone interested in the lubrication of diesels, Sun Oil's 52-p Technical Bulletin B-1, "Lubrication of Diesel Engines," has been revised and updated. It discusses diesel principles and design, types of engines in use, operating cycles, engine accessories and the choice of the correct diesel lubricants, and includes a quick-reference trouble-shooting chart listing remedies for faulty performance. Available from Sun Oil Co., Philadelphia 3.

(44) CLASSIFIER—The Dorr Co., Stamford, Conn., offers Bulletin 2342 on its newly announced "Dorrco Jet Sizer." It describes the physical characteristics, automatic control mechanism, theory, method of operation, applications, and advantages of this new hindered-settling hydraulic classifier designed for effective sizing and grading of 8-mesh and finer solids. The unit incorporates new design features which result in more effective use of hydraulic water to produce clean, deslimed fractions sized within narrow limits, the company says.

(45) CRAWLER TRACTORS—The story of the complete line of Allis-Chalmers diesel-powered crawler tractors is pictorially told in "FACTS . . . on a New Breed of Tractors" offered by Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. Applications, operational methods, specific feature advantages and detailed specification data of the four crawlers in the A-C line are provided, as well as a review of crawler tractor progress during the past 100 yr.

(46) ALLOY STEEL—A new leaflet discussing "Jalloy, Grade 3," a special alloy steel for heavy-duty use, is available from Jones & Laughlin Steel Corp., Pittsburgh, Pa. It outlines the properties, composition, applications, case histories, and heat treatment of this general-purpose steel offering good resistance to abrasion or wear for mine, earthmoving and preparation-plant equipment.

(47) TRACTOR-TRAILER MOVIE—New Athey color strip film graphically illustrates the applications, construction and design features of the new rear-dump PR21 trailer as part of a high-speed, big-capacity, rear-dump tractor-trailer unit. Details of film's showings from Athey Products Corp., Chicago 38.

(48) INDUSTRIAL RUBBER CATALOG—Raybestos-Manhattan, Inc., Manhattan Rubber Div., Passaic, N. J., offers new Catalog 25-C on rubber products for industry. Data cover V-belts, transmission belts, conveyor belts, all types of hose, molded products and outlines, and such new R/M products as the Poly-V drive, R/M Super-Power V-belts, "XDC" conveyor-belt cover and Hydro-Lok rubber pipe flange.

(49) STORAGE BATTERIES—C & D Batteries, Inc., Conshohocken, Pa., offers Specification Bulletins CP-536 and CP-537 covering its complete line of lead-calcium and lead-antimony batteries for control, switchgear and auxiliary power applications. Specifications include data on battery ratings and capacities, details of design and construction, dimensions, weights, and types of containers.

(50) BUSHINGS—Bulletin A-628A from the Dodge Mfg. Corp., Mishawaka, Ind., discusses the varied applications of Taper-Lock bushings, hubs and adapters for sheaves, pulleys, flywheels, couplings, sprockets, impellers, etc. Included are cross-section drawings, bushing numbers, bore sizes, dimensions, weights, keyseats and list prices.

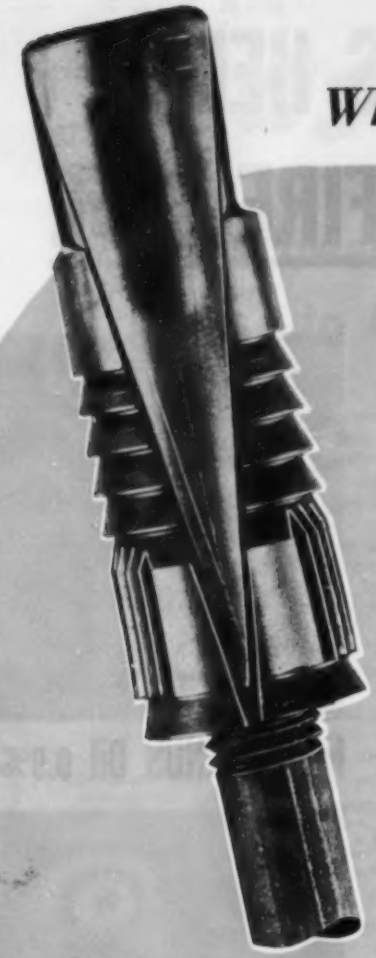
(51) MOUNTABLE COMPRESSOR — Bulletin describing the Le Roi 600 CTM (compressor, tractor-mounted) points out that the recently introduced power take-off compressor is available for mounting now on any leading make of crawler tractor. Describing its application, the folder states: "A crawler with weak, worn tracks incapable of producing enough traction for dozing or scraping, usually has a good engine still worth saving." Offered by Le Roi Co., subsidiary of Westinghouse Air Brake Co., Milwaukee 14, Wis.

(52) CORE DRILL—Bulletin 160 offered by Sprague & Henwood, Inc., Scranton 2, Pa., provides complete information, specifications and working data on its Model 142 Core-drilling machine, a high-speed heavy duty diamond-core unit designed and built for severe and rugged service. Also listed are accessory equipment needed for diamond drilling, most of which is available for immediate delivery.

(53) LUBRICATION FILTERS—Trabon Engineering Corp., Cleveland 14, Ohio, offers Bulletin 545 on its Series SH and DH high-pressure lubrication filters. The light but sturdy Trabon filters are constructed of high-tensile cast aluminum with steel sump and tie rod and are built to withstand 1,000-psi working pressure and 1,800-psi test pressure.

(54) V-BELT DRIVES — Worthington Corp., Harrison, N. J., now is preparing a series of five easy-to-file "Trouble Savers" to help users of V-belt drives. Mailer V-1400-M39, first in this series, explains what to look for when the V-belt drive doesn't deliver maximum rpm, and shows the right and wrong ways of applying V-belt drives.

What's NEW in Roof Bolting



PATTIN Has Designed a New Self-Centering Bolt Head and Protective Shell Tube.

THREE new improvements — each one helping to solve a packaging, shipping or installation problem—cut usual bolt handling and installation time up to 30%. Bolting crews can now be furnished with shipping bundles of 250 assembled bolts and shells containing 25 smaller bundles of 10 assemblies for easy handling—each shell covered with a protective tube, as shown above, to prevent damage to threads. It takes only a few seconds to remove the shell's protective tube and slip a plate washer (having a sufficiently large hole) over the shell and down the bolt to the new supporting bolt head that self-centers the plate washer on the head and it's then ready to be installed. Shipping—with bolt and shell assembled and with protective tubes covering the shells means—good bolt and shell thread fit—no lost parts—easier and quicker handling and installation—which mean savings in time and dollars. No special nuts or ears are needed on the bolts.

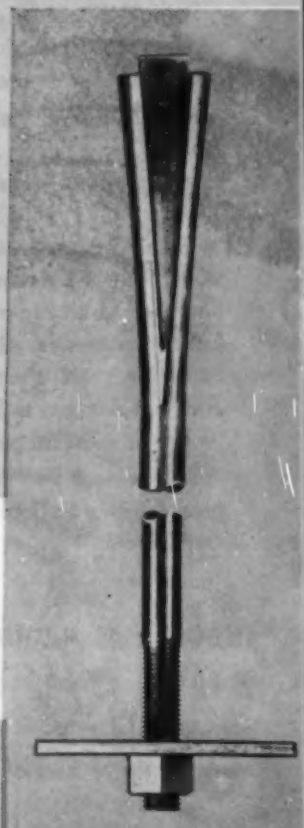
For safer roofs—hard or soft—the PATTIN expansion shell having double the usual shell expansion plus a 3-inch contact with the hole wall provides the strongest known anchorage for roof bolts. They are easy to install as no definite drilling depth is required and the shell can be anchored any place in the hole without turning while being tightened.

Patents Applied For

PATTIN'S New Self-Centering Bolt Head

THE PATTIN SPLIT TYPE BOLT, one of the first slotted bolts, continues to be a favorite wherever split type bolts are used. The bolt is a full 1-inch in diameter with cut threads and furnished with Hex or Square nuts and various size plates and wedges.

ALL MINING COMPANIES now bolting, experimenting or planning to roof bolt can depend on PATTIN shells and bolts for better anchorage and reduced time in bolting cycles. Our engineers are available for consultation and demonstrations. Write or phone us—we'll gladly work with you on any present or future bolting program.



PATTIN MFG. COMPANY

"The Pioneer in Roof Bolting" Marietta, Ohio

HOW NEW SOLNUS OILS HELP MAKE AIR COMPRESSORS FIRE SAFE

Actual photographs show amounts of carbon residue left after dropping equal quantities of Solnus and two other oils on steel plates and baking in a closed oven at 500°F for 24 hours. The three oils all had viscosities of 300 SUS at 100°F.

SEE HOW CLEAN SOLNUS LEAVES HOT METAL

New SOLNUS Oil 0.9%

Typical Naphthenic Oil 5.5%

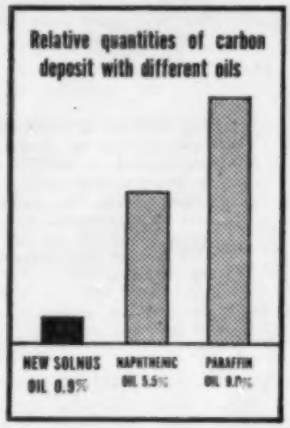
Typical Paraffinic Oil 9.0%

The biggest cause of air compressor fires or explosions is carbon formation on valves and in discharge lines. The best way to avoid these risks is to use the lubricating oil having the lowest tendency to form carbon.

New Solnus Oils have been proved ideal for air compressor use. The minute amounts of carbon that will form are of a fluffy nature; so they blow off quickly and do not build up. Thus the danger of fire or explosion is largely removed.

Solnus Oils have other important advantages, too. Your compressors need cleaning less frequently. This reduces maintenance costs. Shutdowns are less likely. Plant efficiency is increased.

Solnus Oils are also ideal for circulating systems, hydraulic systems, gear boxes, and general lubrication of your industrial equipment. They simplify your storage problems by doing with *one oil* many jobs that would otherwise require *several*. Combine their ability to protect metal parts against corrosion, their resistance to oxidation, and their moderate price and you see how Solnus Oils give you "more lubrication per dollar."



Let us send you our complete technical bulletin on Solnus Oils. Just write Dept. CA-9.

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Made by the refiners of famous Blue Sunoco Gasoline and Dynalube Motor Oils

NEWS ROUND-UP

Atomic Power No Threat, Coal Use to Grow, AEC Says

COAL WILL NOT SUFFER at the hands of atomic power, the Atomic Energy Commission told Congress in its latest semiannual report made public last month. The "rapidly expanding market for fuels for the generation of electricity and other purposes, and the time required for nuclear power development, should allay fears that competing fuels—particularly coal—may be hurt by the entry of nuclear power into the market," the AEC said.

At the same time, the AEC pointed to the sharp rise in U. S. fuel consumption anticipated in the next two decades and predicted that 815 million tons of coal will be used in 1975, with electric power plants requiring three times the tonnages they are currently using. In making this prediction, the AEC bears out various fuel authorities cited in *Coal Age* and elsewhere who have estimated a 1975 coal demand ranging from 750 million to 1 billion tons.

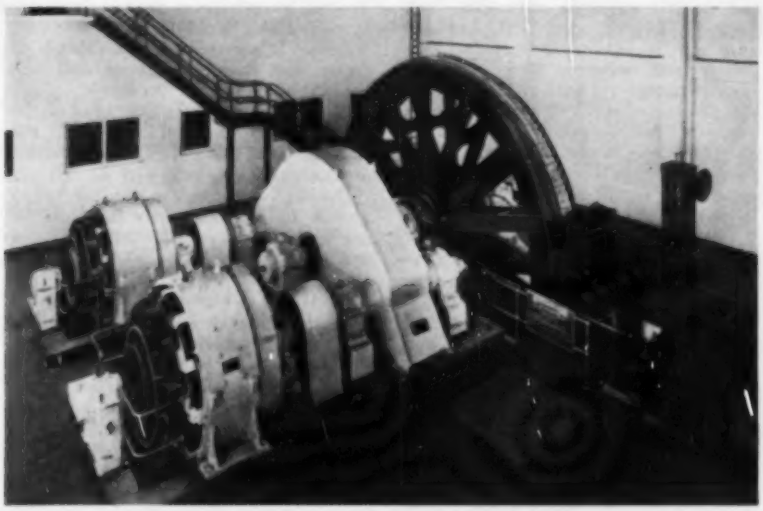
"The contribution that nuclear power can reasonably be expected to make toward total requirements for electric power by 1975 would do no more than moderate the already rapidly rising demand for conventional fuels," the AEC report continued. "Because fuel supplies to meet the future generation of electricity may have to be doubled or trebled at the same time that demands on fuel for other purposes (heating, vehicles, manufacture, etc.) are also rising sharply, nuclear power is not a threat to the existing market for other fuels. Continually rising amounts of coal will be needed to supply electric generating facilities already in operation when nuclear power first becomes competitive and to fuel the larger share of new plants for an indefinite time thereafter."

Athough AEC staff studies suggest that atomic energy's share of the total electrical energy production may be from 2% to 10% by 1975, the commission's report cautions that "today, no one can predict whether nuclear power in 1975 will represent 10%, 2%, or some other share of the U. S. electrical output."

The "mastering of a new source of energy is an essential goal," the AEC maintained, because of "mounting demands for energy in all forms, the unpredictable long-term supply of fuels now in use (particularly oil and natural gas), and the limited number of remaining major hydroelectric sites."

In the report, the AEC also says: "The fluid fuels, oil and natural gas, now furnish the major part of our total energy requirements, and by 1975 the proportion may be as high as 70% if supply permits. Demands on this scale accompanied by gradually rising prices, might mean that oil from shales or synthetic fluids from coal would become competitive within the next 20 yr. Such demands may not lead to early exhaustion of our energy resources, but they seem likely to affect in varying degrees the cost of fuels—more so for gas and oil than for coal. Coal reserves are ample to meet projected consumption far beyond 1975, but rapidly rising rates of consumption may require us to turn in the last quarter of the century to higher-cost and lower-quality coal."

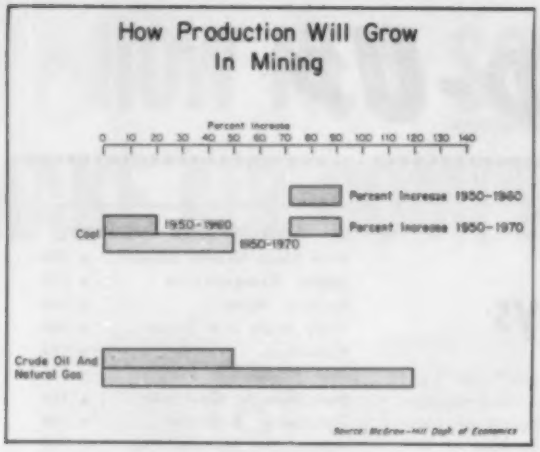
Also in This Section

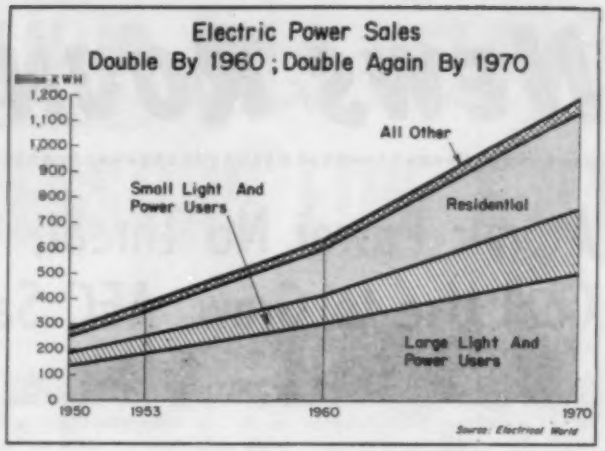


3,720-Hp Hoist Installed at British Coal Mine

THIS 3,720-HP UNIT, the first of a number of large Koepe hoists ordered by the National Coal Board in Britain's coal-mine electrification program, is being installed at No. 2 shaft, Bradford Colliery, Manchester, to hoist coal from an ultimate depth of 3,822 ft. Coal will be extracted from three successive levels, at 2,802 ft, 3,312 ft and 3,822 ft, each having a life of about 30 yr. The unit is equipped with two 12-ton skips for a rated production of 400 tph from any of the three levels. The Koepe wheel is 24 ft in diameter, and will be operated at 30 rpm for a rope speed of 37.8 fps while hoisting from the uppermost level initially.

The new unit, biggest so far for a British coal mine and the first Koepe hoist to be installed in Britain since 1927, is reeved with a 2¼-in main rope with a guaranteed breaking load of 278 tons and a balance rope with an estimated breaking load of 180 tons. The m-g set for the two hoist motors is a 3,070-hp, 750-rpm, 6.6-kv synchronous motor, directly coupled to two generators to produce 660 v, DC, for the hoist motors on rms loading. Excitation for the m-g set motor is provided by a 26.4-kw, 43.5-v generator, and the Ward Leonard excitation is provided by a 23.3-kw, 220-v machine. Hoist-motor ratings are 3,720 hp continuous (rms); 6,000 hp, normal working peak; and 8,600 hp, peak torque for rope-stalled in the headframe for assisting rope changing duty. A 300-hp winch is in-changes.





How Much Growth Ahead?

HOW BIG will the American economy grow by 1960? By 1970?

What role will coal play in the nation's growth?

The potential for industrial and economic growth in the years ahead is the subject of a recent report prepared by the Department of Economics, McGraw-Hill Publishing Co. This report revises and up-dates similar reports made in 1950 and 1952.

Authors of the 1954 study warn that it is not intended as a forecast of where the economy or any part of it will stand at any given time, because there are bound to be ups and downs along the basic trend lines. Nor is the report a forecast of how big the economy would be if all human and material resources were fully exploited. It is, rather, a forecast of probable growth, not maximum possible growth.

For coal men who plan ahead, some parts of the report hold special meaning. Those parts are excerpted and briefed below.

People, Products and Services

Population is growing at the rate of over 2 million per year. By 1970, it will grow to over 200 million; the labor force, to 82 million. Gross national product—that is, total output of goods and services—has been growing at the rate of 3% every year since 1930, and will continue.

Productivity

From 1930 to 1950, output per man-hour increased about 2% per year, with gains as high as 3% in some years. Since 1950, the gains have been greater. In the years ahead, we may reasonably hope for productivity increases averaging 2½% per year.

Gross national product will grow from $367 billion in 1953 to $415 billion in 1960 and to $560 billion in 1970—all measured in 1953 dollars. These estimates allow for a drop in the average work week from 41 hr in 1953 to 38 hr in 1960 and to 35 hr by 1970. More power and fuel and less muscle will play a leading role in these changes.

Research and New Industries

Total spent by industry for research in the last 10 yr has grown from about $1 billion to over $3 billion. The result: New products and even new industries. For example, in the past 5 yr electronics output has increased 145%; plastics, 85%; aluminum, 100%.

Nobody knows what surprises the technology of 1970 may hold. But there are industrial revolutions already in the making—in chemistry, especially in the development of chemical products from petroleum and natural gas and possibly from coal as well; in metalworking; in electronics and other automatic control devices; and in electrometallurgy.

More Capital Goods

Higher capital expenditures will be needed to increase productive capacity and keep pace with advancing technology. Keeping up with the probable growth in population and gross national product will require a 65% increase in manufacturing capacity by 1970 and three times as much electric generating capacity. Railroads and truck operators will need equipment to handle 80% more freight. By 1970, makers of electric generating equipment may be selling twice their 1953 volume.

Compared with $28 billion capital expenditures for new capacity and modernization in 1953, industry may spend $32 billion in 1960 and over $40 billion in 1970.

More Community Services

The growing population will require a doubling of elementary-school capacity by 1970, plus twice as much hospital capacity and replacement of another one-third that is unsuitable. To take care of the steady increase in traffic, expenditures on streets and highways must double long before 1970.

Better Mining Machines

The high cost of labor in the mining industries will add to the demand for highly automatic machinery. For example, there will be more of the recently developed equipment for cutting and handling coal in a continuous flow from the seam to the surface, thus eliminating the unpleasant and dangerous tasks previously done by miners.

Demand for Fuel and Power

By 1970, power per worker in industry will double. Use of electricity in the home will be five times as high. Total result: Three times as much electric power consumed in 1970.

Mostly from coal and oil. By 1970, coal requirements for power generation may go up as much as 150% (2½ times as much), even with improved burning techniques. Imported fuel oil still will be useful for power generation and home heating but most domestic petroleum probably will be converted to high-grade chemicals, gasoline and lubricants. Total demand for petroleum products will rise by over 100% by 1970, mainly for propulsion. If necessary, the petroleum industry can convert shale or coal into liquid fuels.

Natural gas will take over most of the home-heating market, leaving the cheaper chemical and power-generation uses to coal.

By 1970, coal may be gasified underground and piped directly to plants for use in steam boilers or for breaking down into chemicals.

Industrial Chemicals

Most industrial chemicals will grow along with the Nation's economy. Sharpest growth will be in synthetic organic chemicals, especially petrochemicals. By 1970, about three-quarters of all synthetic organics will be made from petroleum or natural gas, compared with one-quarter from petroleum sources and three-quarters from coke ovens in recent years.

Atomic Power

By 1970, as much as 20% of new power installations may be using atomic fuel. This would be equal to 3% of total capacity in place in 1970.

Fuller 10-B-1120 Transmissions give Allegheny Construction Equipment Company of Pittsburgh, Pennsylvania, the faster, easier shifts they need in their fleet of Autocar dump trucks, which haul 30-ton payloads on grades up to 15%.

Leading Truck Manufacturers Standardize on Fuller Transmissions

. . . for Fuller Transmissions have *proven* themselves in all types of on-and-off highway service, where load-and-road conditions are the toughest. Outstanding performance and *customer satisfaction* has created such a demand that leading truck manufacturers have *standardized* on Fuller Transmissions.

Famous "extras" that mean longer wear life, quiet operation, easy shifting are: . . . crowned gear teeth that reduce load concentration . . . offset mating gears to limit load concentration.

More than 110 different models are available, for trucks from 100 to 400 hp, engines from 330 to 1440 cubic inches . . . there is a Fuller Transmission *designed* with your job in mind . . . ready to help you move more, *for less.* Check with your local truck dealer for the *right Fuller* Transmission for your job.

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Unit Drop Forge Division, Milwaukee 1, Wisc. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Western Dist. Branch (Sales & Service, All Products), 641 E. 10th St., Oakland 6, Cal.

Bureau Survey Team Suggests Switch Of Coal Mine Inspection to States

An accelerated educational program to boost the level of state inspection services so that the need for federal coal mine inspection eventually would be eliminated was one of the recommendations for overhauling the U. S. Bureau of Mines made by a 5-man survey team after 6-mo study of the Bureau's organization and operation.

The proposal was among the many recommendations for reorganization of the Bureau approved by Secretary of the Interior Douglas McKay and passed along late in July to the director of the bureau for appropriate action. In transmitting the survey team's report, Mr. McKay indicated that the director may make minor modifications where he believes such changes are not a significant departure from the team's recommendations.

In the survey report there were four basic recommendations for reorganization underlying the 39 detailed proposals, as follows: (1) reduction of the bureau's regions from nine to four; (2) full separation of the administration of health, safety and coal-mine inspection activities from scientific and technical research activities; (3) coordinated strengthening of all statistical and commodity analysis work; and (4) adoption of an organization plan under which the Washington office retains responsibility for policy and program determination, while conduct and management of research are decentralized.

The survey group recommended the appointment of an assistant director of the Bureau for health, safety and coal mine inspection and an assistant director for program. In transmitting the report, Mr. McKay directed that provision also be made for a new position of deputy director.

In discussing health, safety and inspection work, the survey recommended that the staff of the Washington headquarters be kept quite small, with operating personnel and direct supervisors located as close to the mining areas as possible. A major effort should be directed toward educational work in safety and inspection, it emphasized, with teaching ability sought among present personnel and made one of the requirements for future appointees. The bureau should increase its co-operation with state departments, miners and operators to bring all state inspection services up to the general standard of the bureau's coal mine inspections so that "the need for federal coal mine inspection will decrease and eventually cease to exist." Any part of appropriations not needed for inspection should be used for this educational work and it should be possible to accelerate the program, already started to a small degree, since there are today more inspectors but fewer mines to be inspected than at any time since federal inspection was first required, it said.

Other recommendations regarding safety included: making available to miners and management changes in the interpretation of the Safety Code before they are put into effect; determination of the reasons and need for increasing the minimum yearly inspections to three for all Title III mines; use of written examination on mining and safety practices and methods in qualifying inspectors; and a revision and simplification of the present inspector's report. Another recommendation that inspectors notify operators and the mine safety committee the day before an inspection so that arrangement can be made to facilitate it was reserved by Mr. McKay for further consideration.

The team also maintained "that the research work on synthetic gaseous and liquid fuels from coal and lignite be confined to small scale activity and not expanded or developed into large and pilot demonstration plants." Experimental work on production of oil from oil shale at Rifle, Colo., done solely by the bureau, should cease and no further work should be done with the new retort unless industry cooperates with a substantial contribution, it said. In addition, it recommended that the bureau do everything possible to terminate its activities in the production of helium, zirconium and titanium.

Members of the survey team were: Dr. Curtis L. Wilson, dean of the Missouri School of Mines; John C. Kinnear Jr., former vice president, Kennecott Copper Corp.; Dennis L. McElroy, vice president, Pittsburgh Consolidation Coal Co.; J. R. Butler, president, Butler Johnson Corp., and president of the Independent Petroleum Association of America; and Spencer S. Shannon, former director, materials office of the National Security Resources Board.

MEETINGS

ASME: Fall Meeting, Sept. 8-10, Schroeder Hotel, Milwaukee, Wis.

Pennsylvania State Bituminous Safety Association: State-Wide First Aid Meet, Sept. 11, Ebensburg, Pa.

Mineral Producers' Association: Annual Meeting, Oct. 7, Hotel William Penn, Pittsburgh, Pa.

Kentucky State-Wide First Aid Meet, Oct. 9, Lexington, Ky.

National Safety Council: 42nd National Safety Congress and Exposition, Oct. 18-22, Conrad Hilton, Congress, Morrison and La Salle hotels, Chicago.

Kanawha Coal Operators' Association: Annual Meeting, Oct. 21. Charleston, W. Va.

Northern West Virginia Coal Association: Annual Meeting, Oct. 26, Fairmont, W. Va.

West Virginia Coal Mining Institute and Central Appalachian Section, AIME: Joint Meeting, Nov. 5-6, Homestead Hotel, Hot Springs, Va.

Kentucky Mining Institute: Annual Meeting, Nov. 11-12, Phoenix Hotel, Lexington, Ky.

Illinois Mining Institute: Annual Meeting, Nov. 12, Hotel Abraham Lincoln, Springfield, Ill.

National Coal Association: Annual Meeting, Nov. 17-18, Hotel William Penn, Pittsburgh, Pa.

Traveling Exhibit Promotes Anthracite to Consumers

EMPHASIZING ANTHRACITE as the "Fuel of the Future," this "Coalmobile" display has been touring anthracite market areas on a regular schedule as a part of the Anthracite Industry Council's program to put across to the public the benefits of anthracite coal and the modern automatic heating equipment now available. In addition to displays, advertising and literature, the unit has a motion picture screen for showings of the industry's new color film, "Black Diamonds." Here, Norman Curtin, Anthracite Information Bureau engineer, discusses a question with a housewife as a part of the Coalmobile's service.

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Five billion pounds of fish yearly. It's a catch that would make the oldtime Gloucester fisherman gasp—yet it's all in the day's work for America's modern fishing industry. And it's a job that couldn't be handled without the aid of *muscles of steel*—indispensable wire rope.

Whether off the Newfoundland Banks, along the Gulf Coast, or in the waters of the Pacific, powerful winch-equipped trawlers depend on Wickwire Rope to haul in their heavily laden nets.

On landlubber assignments, too, Wickwire Rope has a vital role in helping American industry do a better and more efficient job. In the oil fields and the logging camps. In the mines and the quarries. On construction and highway projects. In numerous and varied materials handling operations. On all of these jobs, Wickwire Rope consistently demonstrates its ability to deliver performance that is unrivalled for long-lasting economy and reliability.

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[illegible]

Personal Notes

C. M. Hoard, formerly superintendent of the Barrackville mine, Bethlehem Mines Corp., has been named superintendent of the company's Marion Div., succeeding the late **W. E. Hall.** A graduate of the West Virginia University School of Mines, Mr. Hoard has been with Bethlehem since 1927. **Charles K. Dunlap** has succeeded Mr. Hoard as superintendent. Mr. Dunlap has worked at the Barrackville property since his graduation from the University of Illinois in 1942.

Morris Creditor, a director of the West Virginia Coal & Coke Corp., was elected executive vice president of the company at a meeting of the board of directors held Aug. 18. Mr. Creditor also is president of The Ohio River Co., a wholly owned subsidary of West Virginia Coal & Coke. **A. H. Crane,** vice president and secretary-treasurer of the company, was elected a director at the meeting.

At a stockholders meeting held Aug. 13, **T. C. Mullins Jr.** was elected president of the Midland Electric Coal Corp. to suceed his father, the late T. C. Mullins. Mr. Mullins Jr. has been with Midland Electric since coming out of the army in 1945 and formerly was a vice president of the company. **W. E. Mullins,** with the company for many years and previously a vice president, was elected to the newly created position of chairman of the board of directors. **Harry M. Ziv,** vice president of Walter Bledsoe & Co., was named to the board of directors. Midland Electric has its main office in Indianapolis and operates one mine at Atkinson, Ill., and two mines at Middle Grove, Ill. The company's 1953 output was over 2 million tons.

Frank Earnest Jr., president of the Anthracite Institute, has been named a consultant to Harold Stassen, head of the Foreign Operations Administration. Mr. Earnest will advise the FOA in connection with its recently announced plan to purchase some 10 million tons of coal, both anthracite and bituminous, for aid to countries abroad.

Mike Zakotnik Jr. has been named general superintendent of the Kemmerer Coal Co., Kemmerer, Wyo., and the Gunn-Quealy Co., Rock Springs, Wyo. Mr. Zakotnik, who has been with the Kemmerer company since 1931 and formerly was mine superintendent, succeeds **Glenn E. Sorensen,** recently named president of the two companies.

David J. Jones, who retired July 1 as chief chemist of The Hudson Coal Co., Scranton, Pa., after 37½ yr of service with the company, was honored Aug. 12 with a dinner attended by some 40 associates and friends.

William D. Hughes, vice president in charge of real estate, and **Mrs. Martha Custer Curry,** assistant treasurer, Johnstown Coal & Coke Co., Johnstown, Pa., recently retired. The two officials, who served the company for a total of 85 yr, were originally employed by the late Andrew B. Crichton and later became affiliated with Johnstown Coal & Coke which was organized by Mr. Crichton.

Elmer R. Kaiser has been appointed director of research, American Society of Heating and Ventilating Engineers, with headquarters at the research laboratory in Cleveland, Ohio. Mr. Kaiser, for the past 20 yr, has been actively engaged in research work in the field of fuels, serving on the staff of Battelle Memorial Institute and Bituminous Coal Research, Inc.

Russell W. Beamer, former employee training director, Rochester & Pittsburgh Coal Co., Indiana, Pa., has been appointed chief tax assessor for Indiana County, Pennsylvania.

James R. Garvey has been named assistant director of research, Bituminous Coal Research, Inc., succeeding Elmer R. Kaiser, resigned. Mr. Garvey will also serve as general manager of B. C. R Products, Inc. Joining BCR in 1946, Mr. Garvey helped establish a BCR Columbus branch in 1948, and has been responsible for building operation, maintenance and supervision of laboratory research projects. Prior to joining BCR, Mr. Garvey was employed by Hanna Coal Co. and Pittsburgh Coal Co., working in their underground mining, preparation and research operations.

News Briefs and Trends

W. Va. Operators to Survey Markets, Coal Use by State

Plans for a state-wide survey of coal markets and use were announced Aug. 10 by a committee of 10 West Virginia coal operators headed by Laurence E. Tierney Jr., president of the West Virginia Coal Association, following a conference with Gov. Marland. In suggesting the meeting of industry representatives, Gov. Marland proposed that "we first put our own house in order" by using coal instead of oil or gas in state-owned buildings. In his invitation, the governor also suggested that the coal business might be aided by "a more vigorous offensive for domestic markets." Development of domestic markets in the state and action on other industry problems were among the major objectives of the newly formed committee, it was understood.

In reporting that he had asked all state departments to lend every assistance in the survey of coal use, Gov. Marland said that he hoped effects of the survey would extend also to county and city governments. Other members of the committee beside Mr. Tierney include: J. A. Dillon, McAlpin Coal Co.; Herbert Jones, Amherst Fuel Co.; C. A. Hamill, Sycamore Coal Co.; George Higinbotham, Consolidation Coal Co. (W. Va.); Harry Kennedy, Kanawha Coal Operators' Association; Roland Luther, Peerless Coal Co.; John J. Foster, Island Creek Coal Co.; Carl Andrews and Robert Lecross, West Virginia Coal Association.

Armco Steel Buys W. Va. Mine

Armco Steel Corp. has acquired the stock of the Princess Dorothy Coal Co., which operates the Robin Hood mine in Boone County, W. Va., W. W. Sebald, Armco president, announced Aug. 4. The Robin Hood mine, which has a capacity of 50,000 tons monthly and employs about 300 men, will be operated by a separate company for the time being, it was reported. L. F. Reinartz, Armco vice president, will be the new president of the Princess Dorothy Coal Co., and Andrew O'B. Hogue, president of the company for many years, will be vice president in charge of operations.

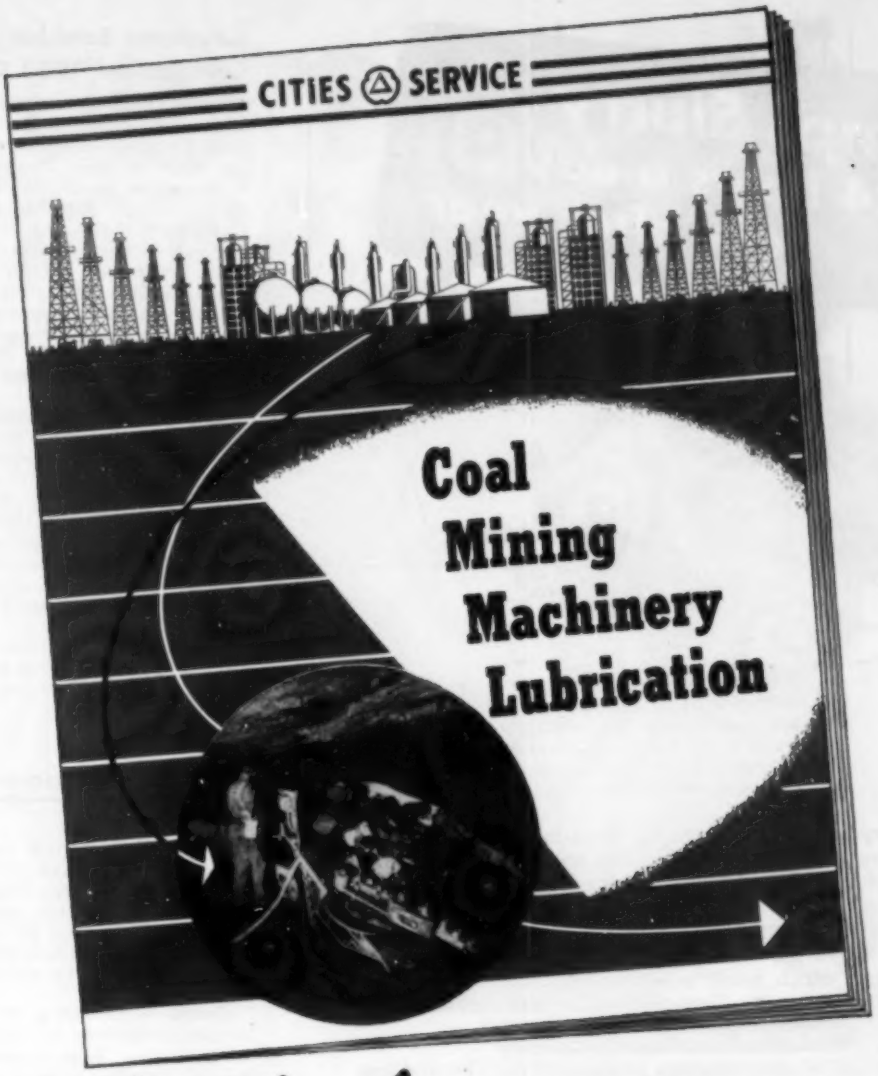
Government to Ship 10 Million Tons of Coal to Other Nations

Plans to ship 10 million tons of American gift coal to friendly countries during this fiscal year ending June 30, 1955, were announced Aug. 5 by Harold Stassen, director of the FOA. The tonnage, which will be in addition to the coal now being purchased abroad with free dollars would not only ease unemployment in American coal mines but step up industrial activity overseas and create new markets for coal, Mr. Stassen pointed out. The tonnage is estimated at about four times that sent abroad under the FOA program during the 1954 fiscal year ending last June and exceeds the agency's previous record of 8,600,000 tons in 1949. According to Mr. Stassen, dockside prices will range from $16 to $17 for anthracite and average around $10 a ton for bituminous coal.

U. S. Steel Starts Work on 12,500-TPD Coal Washer

State, county and local civic leaders joined with U. S. Steel officials Aug. 3 in ground-breaking ceremonies starting construction of a new coal-washing plant at Corbin, Ky. Karl L. Konnerth, vice president of U. S. Steel's coal operations, formally started construction when he cut a bulldozer blade into the ground on the plant site. Other company officials participating in the ceremony included: W. L. McMorris Jr., general manager, coal preparation and distribution; R. H. Knapp, chief engineer—coal; and W. G. Talman, general superintendent, Gary and Lynch districts. To be known as the Corbin washer, the 14-story-high structure will be equipped to wash coal mined at Lynch, Ky., for U. S. Steel's lake shore steel plants at the rate of 12,500 tons a day and is expected to be completed early in 1956. After washing and drying, coal will be mixed to uniform consistency and

Continued on p 144



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CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Keystone Booklet Lists Companies' 1953 Output

Actual 1953 production figures for every coal company in the country producing 100,000 tons or more in that year are listed in "Coal Production in the U. S. A., by Companies, for the Year 1953," recently published by *Keystone Coal Buyers' Manual*, a *Coal Age* affiliate. The only such compilation of production figures for the coal industry available on a national basis, the booklet is published annually and shows company affiliations, the states in which they operate, captive and strip tonnages, with the companies listed in order by the total tonnages of the affiliated groups.

In announcing the current edition, Keystone points out that the 442 bituminous companies listed produced 390,920,603 tons in 1953, or 86.3% of the year's total. The 39 anthracite companies mined 26,122,398 tons, or 88.4% of the total. Comparison of 1953 output with previous years for various tonnage classifications, strip and auger mining and captive operations are among the statistics included in the study.

The 1953 "Coal Production" booklet is available at $5 a copy from *Keystone Coal Buyers' Manual*, 330 W. 42nd St., New York 36, N. Y.

Obituaries

W. E. Hall, 70, for the last 9 yr division superintendent of the Marion Div., Bethlehem Mines Corp., died July 28 at Fairmont, W. Va., after a long illness. Mr. Hall spent his entire life in coal mining and had been with the Bethlehem organization for more than 30 yr.

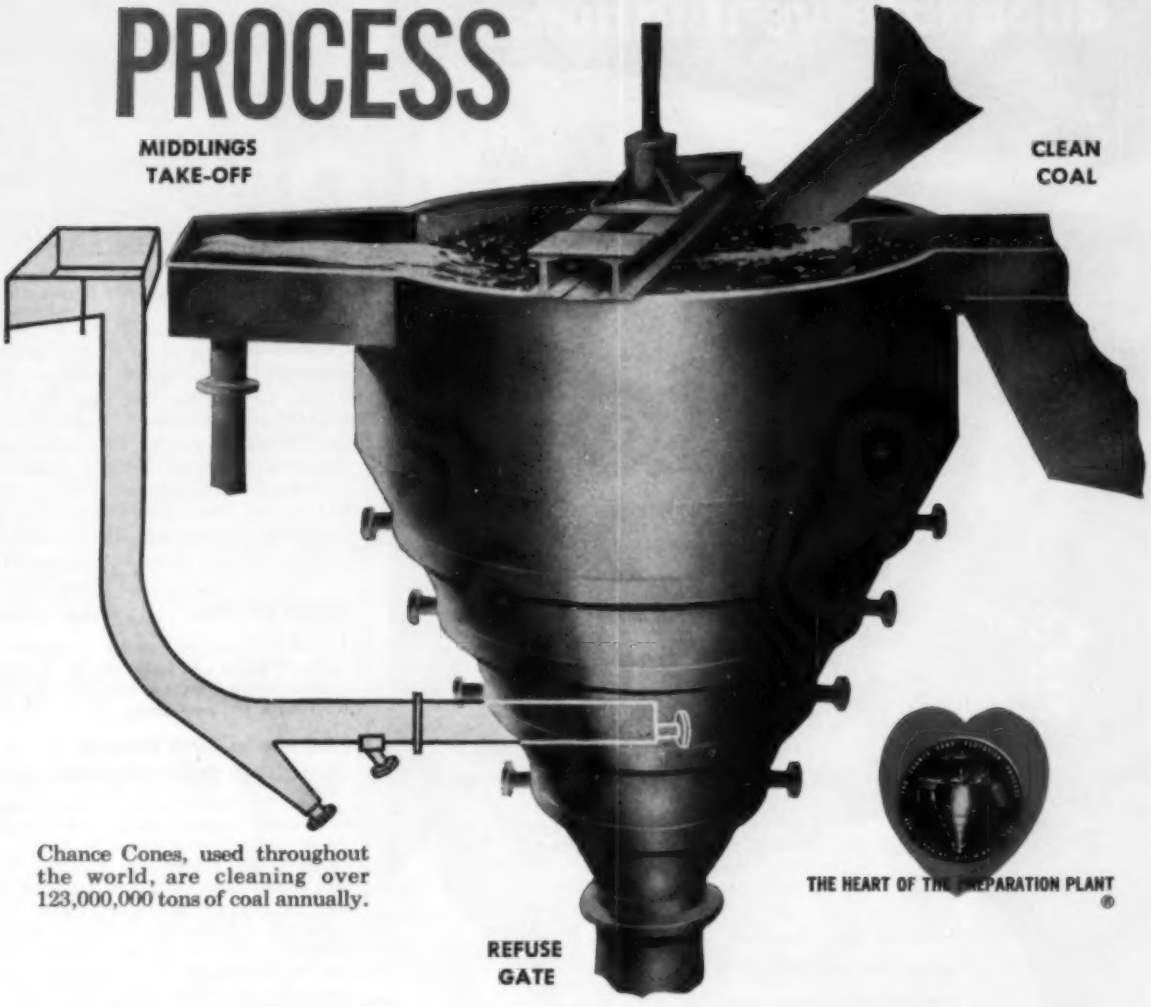
Joseph W. Terteling, 59, a member of the construction firm of J. A. Terteling & Sons, Boise, Idaho, and active in coal stripping in Western Kentucky, died Aug. 8 in Honolulu following a heart attack while vacationing in Hawaii with his family. With N. L. Terteling, Mr. Terteling owned Terteling Bros., Inc., and served as president of the firm, which operates the Vogue and Pond River mines at Madisonville, Ky. One of the four sons who joined with their father to form J. A. Terteling & Sons in 1923, Mr. Terteling also was widely known in the heavy construction industry.

Edgar M. Cortright, 69, died Aug. 23 at his home in Jenkintown, Pa. A 1906 graduate of the University of Pennsylvania, Mr. Cortright had been vice president of the Cortright Coal Co., Philadelphia, and president of the Hastings Fuel Co., Hastings, Pa., until his retirement last spring.

Jack E. Taylor, 65, general manager of the High Splint Coal Co., High Splint, Ky., and president of the Harlan County Coal Operators' Association, died July 20 following a heart attack at Williamsburg, Ky. Mr. Taylor had been with High Splint for 20 yr.

CHANCE PROCESS

THE HEART OF THE PREPARATION PLANT



Chance Cones, used throughout the world, are cleaning over 123,000,000 tons of coal annually.

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When an important unit in a coal preparation plant works *well*—easily, efficiently and economically, it needn't be given a "new look" every year. That is why Chance Cones installed today look very much like those made ten years ago.

But there *is* a difference—an important one.

Today, the Chance Process yields *3* products, not 2. There is now a middlings take-off, adjustable from 1.30 to 1.90 gravity, that enables you to recover and market a greater part of your tonnage. Moreover, this take-off can be fitted to older, two-product Chance Cones. Your inquiries are invited.

ADVANTAGES OF THE 3-PRODUCT CHANCE CONE

- New low-maintenance method of elevating refuse
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- Cleans coal down to 1.35 gravity
- Recovers 99% of salable coal
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WITH A BACKGROUND OF OVER SEVENTY YEARS' EXPERIENCE

Old Timers' Cite VPI Student

OLD TIMERS' AWARD to the outstanding senior student in mining engineering at Virginia Polytechnic Institute, Blacksburg, Va., is received by Ellis Paxton Bucklen (right) from M. D. Cooper, director of mining engineering education for the National Coal Association and secretary of the Old Timers' Club. Dean Emeritus E. B. Norris (center) assists in the ceremony.

NEWS BRIEFS . . . . . From p140

loaded into hopper cars for transport to Lake Michigan and Lake Erie U. S. Steel mills. Allen & Garcia is the general contractor for the new plant.

P&R Marks 50th Year of Continuous Safety Program

The 50th anniversary of the founding of its safety program, believed to be the oldest continuous program in American industry, was observed by the Philadelphia & Reading Coal & Iron Co. Aug. 14 with an intra-company contest of its first aid teams at Lakewood Park, near Pottsville, Pa. More than 1,000 people, including employees, their families, company officials and guests, saw the teams representing various operating units compete for the title of Golden Anniversary First Aid Champions. J. J. Forbes, USBM director, presented Joseph A. Holmes Safety Association Certificates of Honor to three P&R operations for outstanding safety achievements. Gordon E. Smith, Deputy Secretary of Mines, represented the Pennsylvania Department of Mines, and Edward G. Fox, P&R president, made the prize awards. Placing first among the six teams participating was that of the Locust Summit central breaker, with a score of 99.833.

Utility Coal Continues Growth

Record-breaking electric-power generation in the United States is resulting in greater coal consumption by the electric utilities, according to the monthly statistics of the Federal Power Commission. Coal consumption for the first 6 mo of 1954 was estimated at 56,511,841 tons, almost a million tons more than in the

Motorman requests right-of-way at the dispatcher

Underground shop receives maintenance orders

How M·S·A MinePhones boosted existing haulage efficiency to handle Powhatan's increased production

With new continuous mining machines and fast-moving shuttle cars funnelling coal to a seven-mile, single-track system from 12 faces, Powhatan Mining Company officials faced the fact that production would "out run" haulage unless a plan could be devised to make existing facilities adequate for the job.

They found the answer in M.S.A. MinePhones. Twelve of these units were installed in the Company's No. 3 mine and another twelve at the No. 1 mine, near Bellaire, Ohio. The new system gives the dispatcher instant, continuous, two-way voice communication contact with locomotive motormen, the underground maintenance shop, and a "jeep" which carries men, and acts as an emergency vehicle. Now, haulage decisions are made quickly, keeping trips moving, minimizing "waits" on sidings. Repair needs are relayed "on the double," over-all safety has improved.

We will be happy to discuss your haulage system, and show you how M.S.A. MinePhones can aid efficiency, increase safety. Write for complete details.

MinePhone-equipped "jeep" carries fire extinguishers, first aid, Chemox breathing apparatus

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initial half of 1953. In the same period, however, imports of foreign residual oil have boomed to around 400,000 bbl a day, on top of 1953 imports of 134,000,000 bbl, equivalent to 34,000,000 tons of coal, the National Coal Association pointed out in analyzing the FPC statistics. Without the influx of foreign oil, the utilities' coal would have been larger, the NCA emphasized. Coal consumption by the electric utilities for all of 1953 totaled 115,893,000 tons, an all-time high.

Unions Okay Opening LNC Mines by New Firm

Plans of new organization to re-open three mines and a breaker among those closed down permanently by the Lehigh Navigation Coal Co. last June got a go-head Aug. 11 with approval of the proposal by the seven local unions in the area and the Panther Valley general mine committee of the UMWA. Heading the new syndicate is W. Julian Parton, president of the disbanded Lehigh Navigation Coal Co., and associated with him is Joseph J. Crane, former manager of the LNC Lansford colliery. Also reported as members of the group are James and Frank Fauzio, stripping contractors of Nesquehoning.

The decision to close LNC Panther Valley mines and liquidate the company was made June 24 at an emergency meeting of the board of managers of the Lehigh Coal & Navigation Co., the parent organization, after miners had refused to go along with the company's five-point plan for lowering production costs even though it had been approved by John L. Lewis and other UMWA officials (*Coal Age*, August, p 116). The company orginally closed down May 3 because of poor markets and continuing heavy operating losses and offered its program as a means of re-opening the properties early in June. According to reports, the new syndicate, which is not connected with LC&N, would employ about 1,300 of the 5,000 men thrown out of work when the properties were closed.

Surface and Stripping Deaths Boost 6-Mo Fatality Rates

The 203 deaths in U. S. anthracite and bituminous coal mines during the first 6 mo of 1954, although 27 fewer than in the same period of 1953, resulted in a rate of 1.03 fatalities per million tons, as compared with 0.96 in the 1953 period, the USBM reports.

Increased fatalities at strip mines and in surface operations were responsible for the higher industry-wide fatality rate. At strip mines, 14 men were killed from January to June, 1954, against eight in the 1953 period, for rates of 0.07 and 0.03, respectively. Surface fatalities increased from 17 to 20, with the rate per million tons moving from 0.07 to 0.10.

In underground mining, the fatality rate in both years was 0.86, with 169 men killed in the 1954 period, against 205 in 1953. In underground bituminous mining, the 167 fatalities in the 6 mo of 1953 declined to 138 in 1954, with a rate of

Continued on p 150

COAL MEN ON THE JOB . . .

JEWELL EAGLE COAL CO., Melville No. 9 mine, Stollings, W. Va. (left photo): E. S. Walsh (left), general mine foreman; B. R. Fleenor, night tipple foreman; H. B. Fleenor (standing), day tipple foreman; and Forrest Hicks, mine superintendent.

LORADO COAL MINING CO., Lorado, W. Va. (right photo): Lowell Leach (left) rodman; Marcus Milam, chief engineer and industrial engineer; John Rush, mining engineer; Frank Hobach and Doran Nester, rodmen. Messrs. Leach and Nester are students who have been granted engineering scholarships by the company.

Gasification Plant Nears Completion in Australia

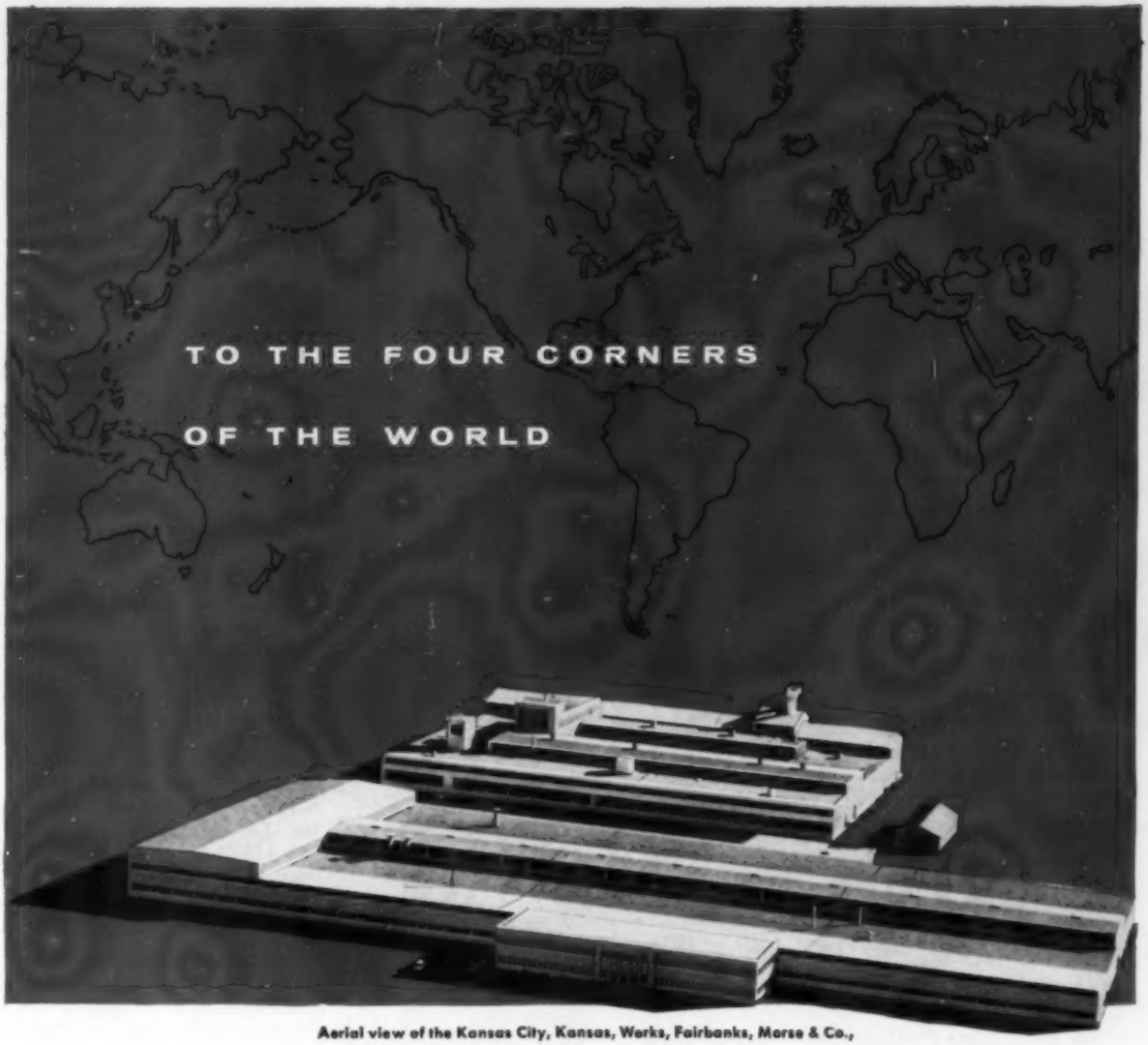
THESE PURIFICATION TOWERS are part of the Morwell browncoal gasification project being built to provide the City of Melbourne, Australia, some 90 mi away, a trouble-free gas supply. In the planning and preparation stage for 7 yr, the plant will utilize the Lurgi process of coal gasification and when it begins operation in about 2 yr will produce about 15 million cu ft of gas a day for transmission by high-pressure pipe line. The initial output is expected to take care of 40% of Melbourne's needs and an eightfold expansion is planned by 1975. Because of its high moisture content, the browncoal, which is in abundant supply in Australia, is briquetted before it is gasified.

0.75 for both years. For anthracite mining underground, a decrease in fatalities from 38 to 31 in the first 6 mo of 1954 resulted in a drop in the rate from 2.55 to 2.33.

As in the past, falls of roof and face continued to be the largest single cause of mine fatalities, killing 113 men in the 1954 period, compared to 137 in 1953, for rates of 0.58 and 0.57, respectively. Haulage, the second largest cause, while cut from 37 to 36 fatalities in 1954, also showed an increase in the fatality rate, from 0.16 in 1953 to 0.18 in 1954.

Retailers Back Anthracite Program

Decision to adopt a second-year anthracite industry program was unanimously voted Aug. 4 by the Eastern States Retail Solid Fuel Conference at its quarterly meeting in New York. The vote was taken following a review of the united industry service program which Aug. 1 ended its first year of co-operative effort to broaden the distribution of automatic anthracite equipment and improve service to con-



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EQUIPMENT APPROVALS

Eleven approvals of permissible equipment were issued by the U. S. Bureau of Mines in July, as follows:

Goodman Mfg. Co.—Type 870-10 cable-reel shuttle car; three 10-hp motors, 250 v, DC; Approval 2-1005; July 2.

Goodman Mfg. Co.—Type 870-11 cable-reel shuttle car; three 10-hp motors, 250 v, DC; Approval 2-1006; July 2.

Joy Mfg. Co.—Type 1CM-2E continuous miner; two 65-, one 15- and four 7½-hp motors, 250 v, DC; Approval 2-1007; July 2.

Joy Mfg. Co.—Type 14BU-7CT loading machine; four 7½- and one 4-hp motors, 440 v, AC; Approval 2-1008; July 8.

Joy Mfg. Co.—AC magnetically locked splice box; Approval 2-1009; July 19.

The Long Co.—Type Joy modified 8-BU loader with detachable Type PT Piggyback conveyor; one 15- and one 4-hp motors, 250 v, DC; Approval 2-1010; July 20.

Jeffrey Mfg. Co.—Type CLS-84-A loading station; 5-hp motor, 250 v, DC; Approval 2-1011; July 22.

Ensign Electric & Mfg. Co.—Type LJ distribution box; 220 and 440 v, AC; Approvals 2-1012 and 2-1012A; July 27.

The Long Co.—Type Model 88 loader with detachable Type PT Piggyback conveyor; one 25- and one 4-hp motors, 250 v, DC; Approval 2-1013; July 28.

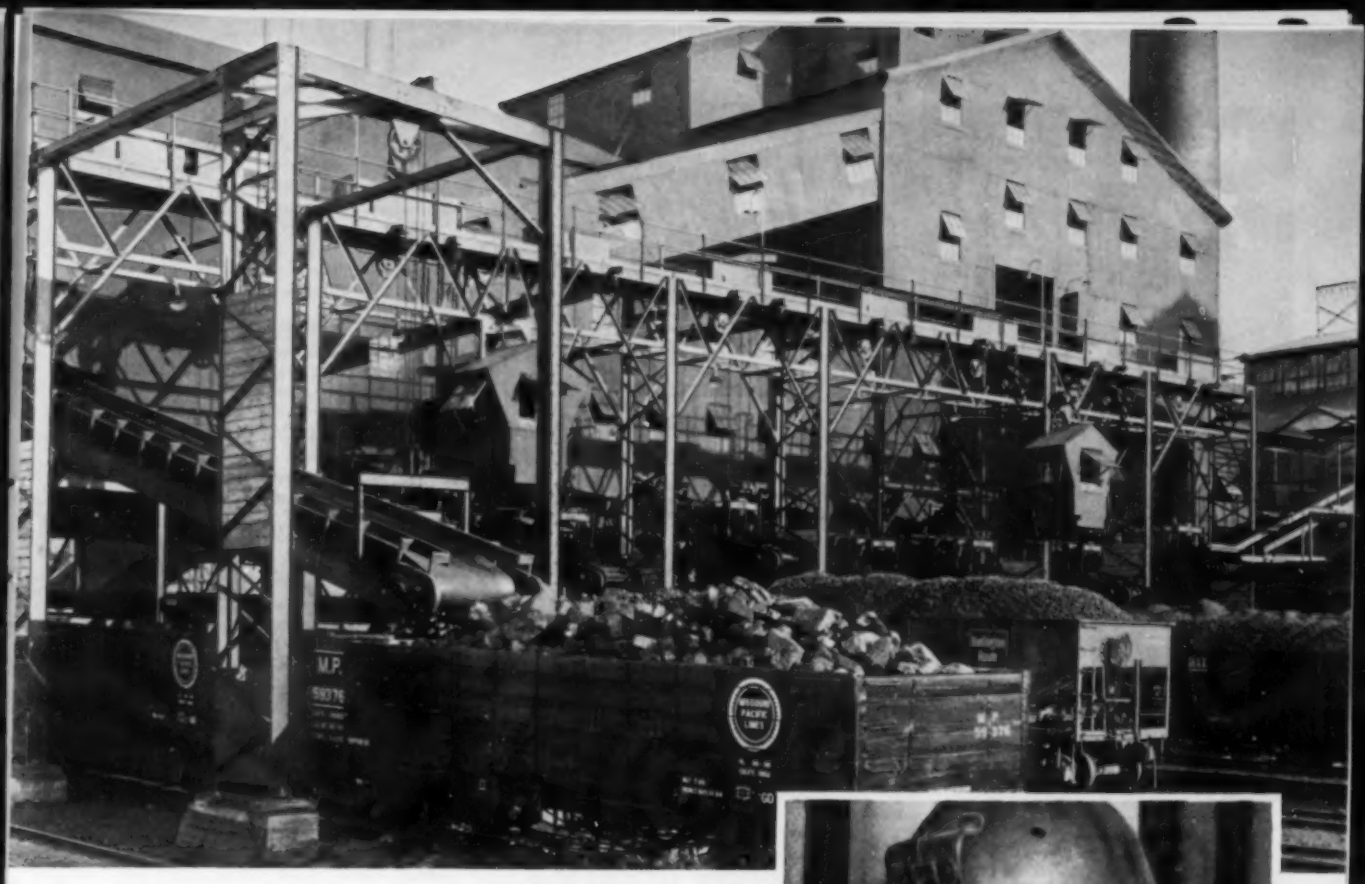
Barber-Greene Co.—No. 366 portable mine conveyor; 3-hp motor, 250 v, DC; Approval 2-1014; July 28.

Transocean Commerce, Inc.—Type 18 Riken gas indicator; Approval 812; July 23.

sumers. The program is administered by the Anthracite Industry Council, composed of all segments of the industry. "More has been accomplished this past year in these directions through this vigorous industry-wide effort than was achieved in the anthracite industry during the past 10 yr," Everett Decker, chairman of the conference and president of Peterson & Packer Coal Co., Troy, N. Y., said in announcing the aprpoval of the retailer group.

Anthracite Week Scheduled

Anthracite Week, utilizing the facilities of the press, radio, TV and advertising to present to the public anthracite's advantages as a fuel, will be observed in Pennsylvania from Sept. 20-26, it has been announced by Ebner S. Abrams, representative of the National Anthracite Industry Council. "We plan a series of demonstrations and exhibits that will emphasize the 'new look' in anthracite



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says Standard lubrication specialist

● The large midwest mine whose preparation plant is pictured above is just one of the many satisfied Standard Oil mine customers throughout the Midwest. In addition to experienced Standard lubrication specialists always ready to give valuable help wherever and whenever it's needed, Standard provides the Midwest's most dependable source for quality greases and lubricants. For every mine lubrication purpose—Standard products prove superior in actual use!

In the mine pictured above, the following products have had a successful job history:

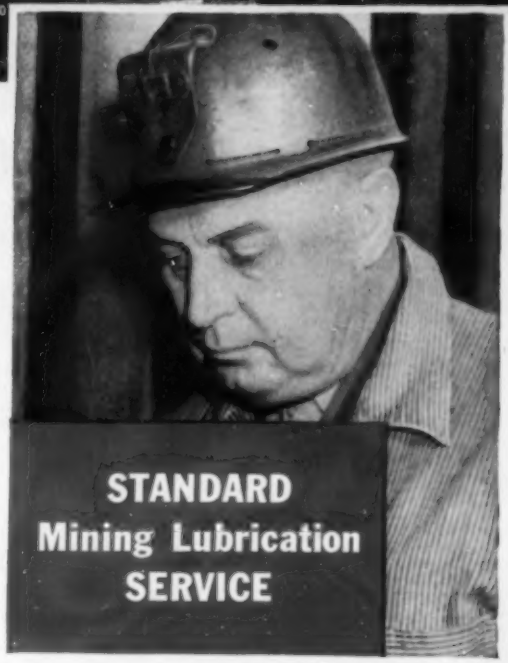
SUPERLA Mine Lubricant No. 00—used in gear cases and hydraulic units of the mine loaders. Result: no clutch or bearing failures; clean, carbon-free clutch plates; no downtime for maintenance on hydraulic units.

SUPERLA Mine Lubricant No. 4—used in the loader gathering heads. Result: despite terrific shock loads, wear has been kept to a minimum.

STANOIL Industrial Oil—used in the speed reducers in the tipple. Result: trouble-free, smooth operation keeps costly maintenance time down to a minimum.

STANOLITH Grease—used throughout the tipple on grease fittings and on conveyor belt idler bearings. Result: better protection; grease consumption reduced; grease application time cut 50%.

Why don't *you* put Standard quality and Standard versatility to work for you today?



Standard Oil lubrication specialist, Herve Dillingham, helped this midwest mine with its lubrication program. The Standard Oil lubrication specialist near you can help you get good results on your lubrication problems. Call your nearest Standard Oil office. Or write, the Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

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equipment . . . so that the public can see for itself why hard coal is safe, economical, clean and convenient," Mr. Abrams said. "We are proud of our product," he maintained. "It has no need to take a back seat to any other fuel on the market, and we want merely to make sure that people in general have the chance to learn how good it really is."

1954 Coal-Company Earnings

Earnings reported below are for the first six months of 1954 ending June 30, compared with the same period of 1953, unless otherwise noted.

Glen Alden Coal Co.—1954 net loss of $169,000, compared to net loss of $1,451,666 for 1953 period.

Hudson Coal Co.—1954 net loss of $2,055,158, compared to net loss of $1,372,370 for 1953 period.

Independent Coal & Coke Co.—1954 profit before charges for depreciation and depletion, $89,076, compared to loss of $162,336 on a similar basis for 1953 period.

Island Creek Coal Co.—1954 net income of $524,855, or 38c a share, on net sales of $15,720,862, compared to net income of $644,210, or 48c a share, on net sales of $19,236,748 for 1953 period.

Lehigh Coal & Navigation Co.—1954 net loss of $1,358,740, compared to net income of $132,612 after tax credit of $324,896, or 6c a share, for 1953 period.

Lehigh Valley Coal Corp.—1953 net loss of $1,095,266 on net sales of $8,163,360, compared to net loss of $1,146,019, including non-recurring profit of $311,431, on net sales of $9,586,936 for 1953 period.

Philadelphia & Reading Coal & Iron Co.—1954 net loss of $1,936,987 on net sales of $22,707,090, compared to net loss of $546,351 on net sales of $28,720,715 for 1953 period.

Pittsburgh Consolidation Coal Co.—1954 net income of $4,587,278, or $2.14 a share, compared to net income of $5,990,612 or $2.77 a share, for 1953 period.

Pond Creek Pocahontas Co.—1954 net income of $326,518, or 96c a share, compared to net income of $682,554, or $2.01 a share, for 1953 period.

West Kentucky Coal Co.—1954 net income of $332,691, or 39c a share compared to net income of $821,288 or 96c a share, for 1953 period.

W. Va. Coal & Coke Co.—Net income for quarter ending June 30, 1954, of $135,324, or 27c a share, compared to net income of $255,924, or 51c a share, for 1953 period.

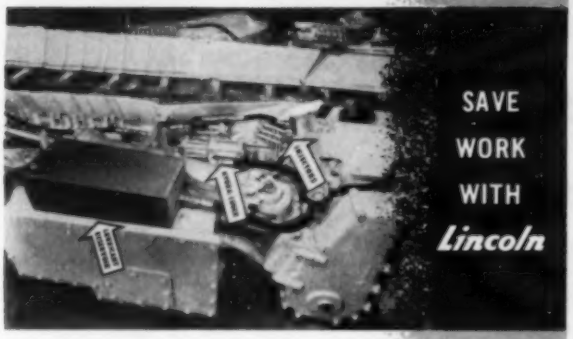
Power Plant Lining Stockpile With 50,000 Tons of Coal

Some 50,000 tons of coal reportedly is being trucked in to serve as lining material for a 1⅛-million ton coal stockpile at the Kyger Creek power plant near Gallipolis, Ohio, one of the two plants under construction by the Ohio Valley Electric Corp. to power the new atomic-energy plant near Portsmouth, Ohio. Haulage of the liner coal, which is to be tamped to depth of 2 ft, will

(Continued on p 158)

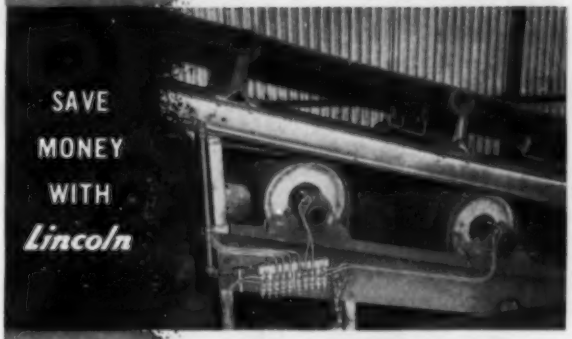
here's why **Lincoln** lubricating equipment

slashes operating costs IN MINES



SAVE WORK WITH *Lincoln*

A Centralized Lubrication System frees manpower for other work . . . automatically lubricates 68 bearings simultaneously, on each loader, at Philip Sporn Mine.



SAVE MONEY WITH *Lincoln*

Centralized Lubrication Systems save Hanna Coal Company $32,240 a year in labor alone at their Georgetown preparation plant.

SAVE EQUIPMENT WITH *Lincoln*

A Lincoln Centralized Lubrication System automatically lubricates 500 bearings and increases the profitable working life of equipment at Wierton's Isabella Mine.

SAVE TIME WITH *Lincoln*

This unique Power Lubrication Unit is taken right to the job to speed up equipment maintenance at Perry Coal Company, O'Fallon, Illinois.

For more information about Lincoln Lubricating Equipment for the mining industries, write for Catalogs 64 and 80.

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COAL MEN ON THE JOB . . .

Amherst Coal Co.

CENTRAL REBUILDING SHOP, Accoville, W. Va. (left photo): Donald Waterson, (left, front row), Homer Ackinson, Bill Venters and John Mazon, shop mechanics; George Altizer (left, back row), supply clerk; Robert Rowe, outside supply foreman, Buffalo Div.; Fred Perry, mining engineer, Buffalo Div.; and John M. Venters, supt. of maintenance.

MINE NO. 1-A, Amherstdale, W. Va. (right photo): Alex Gibson (left), section foreman; Sug Silas, section foreman; and Dewey Burgess, dispatcher, first shift.

How to make your own Mine Roof Jacks

- *quickly*
- *economically*

1 Duff-Norton supplies the head and handle

2 You supply the pipe to save freight, time and money

3 Add the Duff-Norton base of your choice and you have the perfect Mine Roof Jack

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You can choose the type of heads, handles and bases best suited to your particular needs. They are available in a variety of types in both 8 and 16-ton capacities (16 ton requires 2-inch *extra strength* pipe). All fittings are painted light grey for better visability.

For complete information on Duff-Norton Mine Timbering and Roof Jacks and Fittings see your local distributor or write the world's oldest and largest manufacturer of lifting jacks for your free copy of 8-page catalog, "A Handy Guide for Selecting Duff-Norton Mine Jacks That Meets Every Modern Mining Need." This catalog contains complete information not only on Mine Roof Jacks but other popular Duff-Norton Jacks for useful trouble-free service in and around coal mines. Ask for catalog AD-10J, The Duff-Norton Manufacturing Co., P. O. Box 1889, Pittsburgh 30, Pa. Canadian plant—Toronto 6, Ontario.

DUFF-NORTON *Jacks*

"Giving Industry A Lift Since 1883"

require about 50 days and some 125 trucks are scheduled to deliver about 1,000 tons daily. Build-up of the stockpile is slated to begin in November, with deliveries via barge on the Ohio River.

Glen Alden Opening Colliery Closed Down for 2 Yr

Plans for the resumption of operations at the Audenreid colliery, near Hazleton, Pa., with work for most of the 400 men affected by the shutdown several years ago, were announced late in July by William W. Everett, vice president of the Glen Alden Coal Co. Scheduled for immediate re-opening was the No. 1 slope at Treskow, down for about 4 mo. No. 15 slope, closed for 2 yr, was expected to be opened in about 3 wk when construction of a tipple was completed, and it was to be followed by opening of the No. 11 slope as soon as installation of an electric hoist could be completed. Coal from slopes is to be prepared at Junedale, which is to be double-shifted, but construction of a new breaker is being considered, with final plans reportedly hinging on final mining results. Re-opening of the Packer No. 2 colliery of the Lehigh Valley Coal Co., Ashland, Pa., also was recently announced by Jack Schrader, who has a sublease on the property. Some 150 men reportedly will be employed.

Robena Tops 24 Aid Teams in Southwestern Pennsylvania

The Robena No. 2 team of the U. S. Steel Co., captained by John Chambers, placed first with a score of 99.933 among the 24 teams entered in the first-aid contest of the Southwestern Pennsylvania Safety Association held in Waynesburg, Pa., Aug. 21. Runners-up were: Mathies mine, Mathies Coal Co., 99.867, Joseph Hebda, captain; Ronco mine, U. S. Steel Co., 99.801, William J. Callaghan; and Montour No. 10 mine, Pittsburgh Coal Co., 99.800, Andrew Hostovich. In addition to a cash prize of $210, the wining team received the MSA Plaque and the UMWA Trophy. The next nine ranking teams received cash prizes ranging from $70 to $175 and the privilege of participating in the statewide meet.

Cabinet Committee Appointed To Study Nation's Power Needs

A Cabinet Committee on Energy Supplies and Resources Policy to study the requirements and supplies of the major sources of energy, including coal, petroleum and natural gas, was named by President Eisenhower July 30. It is composed of the heads of the State, Defense, Justice, Interior, Commerce and Labor Departments, and the chairman is Arthur S. Flemming, Director of Defense Mobilization. In setting up the group, President Eisenhower directed it to "undertake a study to evaluate all factors pertaining to the continued development of energy supplies and resources and fuels in the U. S., with the aim of strengthening the national defense, providing orderly industrial growth and assuring supplies for our expanding

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Gulf Mining Machine Lubricant can usually do the entire lubricating job at the face and is effective for plain and antifriction bearings as well as for gears and drives in transmissions.

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national economy, and for any future emergency."

Dr. Flemming also is chairman of an inter-departmental committee named earlier by the President to study the bituminous coal situation. Also in Washington late in July, Sen. Malone (R., Nev.), chairman of the Subcommittee on Minerals, Materials and Fuels Economics, said that "expeditious attention" would be given by the subcommittee to the resolution of the Governors' Fuel Conference recommending a study of the Nation's fuel resources and their importance to the national security. "It is long past time to do away with the ridiculous policies that are injuring the coal industry and other industries necessary to our economy and vital to our security," Sen. Malone remarked.

Government Committee Meets With Industry Representatives

The inter-departmental committee named by President Eisenhower July 16 to study the bituminous industry's needs and recommend a policy in the interests of national security met with representatives of the industry in Washington Aug. 23. The government committee is headed by Arthur S. Flemming, Director of Defense Mobilization, and includes representatives of the Interior, State, Commerce, Labor and Defense Departments. Chairman of the coal group is Roger F. Cooper, Kentucky River Coal Corp., and other industry representatives scheduled to participate in the conference included: Harry LaViers, South-East Coal Co.; George H. Love, Pittsburgh Consolidation Coal Co.; Hooper Love, West Kentucky Coal Co.; C. J. Potter, Rochester & Pittsburgh Coal Co.; Raymond E. Salvati, Island Creek Coal Co., R. E. Snoberger, Truax-Traer Coal Co.; A. R. Mathews, Pocahontas Fuel Co., Inc.; John S. Routh, Routh Coal Corp.; and James W. Haley, Jewell Ridge Coal Corp.

And For Your Information . . .

The first major West Virginia watershed to be cleared of coal-waste pollution under a state law enacted last year will be the Coal River. In announcing that all 14 coal-washing plants along the stream and its tributaries will have stopped discharging into the waters by next spring, Lyhle Gillenwater, State Water Commission engineer, pointed out that compliance with the law in this case was "voluntary" and cited it as a test of the effectiveness of co-operation between coal firms and commission.

Start of construction of a new $1½ million cleaning plant has been announced by Stephen Canonico, president of the Compass Coal Co. The plant, expected to be in operation by April, 1955, will be located at the company's Chieftain No. 2 mine, Dola, W. Va.

An injunction prohibiting picketing by the UMWA of a 22 non-union mines in Somerset County, Pennsylvania, in effect since June 19, was dissolved Aug. 10 by Somerset County Judge Thomas F. Lansberry, who said that mine owners had failed to show that mass picketing was

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There's a Thermoid Conveyor Belting designed to lower your handling costs on every mining job. Here are three examples: HT —For extremely abrasive materials such as coal, granite, trap rock, flint rock, quartz ore; A —For slag, lime rock, crushed stone and other highly abrasive materials; C —For moderate abrasives such as sand, loam, soda, gravel.

Thermoid's exclusive impregnation process welds carcass and cover into an exceptionally strong, durable belt. Finest quality reinforcement and specially compounded rubber stocks assure long life . . . lower your handling costs per ton. Your Thermoid Distributor carries a complete line of Thermoid Conveyor Belting, Multi-V Belts and Hose to meet the most severe requirements of any mining operation. Call him or write direct for full information.

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COAL MEN ON THE JOB . . .

CLEMENS COAL CO., Pittsburg, Kan.: C. W. Kincaid (left), tipple superintendent, and V. A. Zigmund, maintenance foreman.

involved and that there had been no reports of violence. UMWA picketing started May 3 when the Cambria Fuel Co. sought to operate non-union after notifying the union that it was terminating its contract because of competitive conditions.

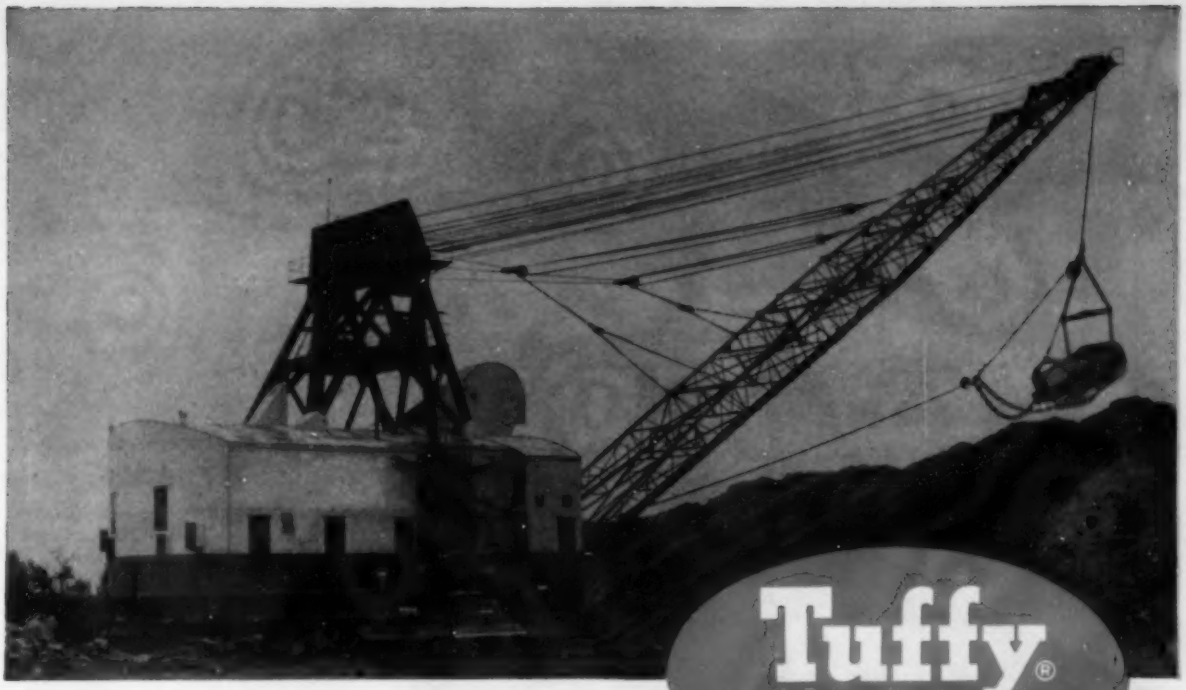
In Armstrong County, Pennsylvania, picketing and vandalism led several coal operators to seek an injunction against the UMWA last month. Following the preliminary hearings, the court gave the UMWA until Aug. 13 to file a written brief.

The Lorado Coal Mining Co. has awarded scholarships in coal mine engineering at West Virginia University to sons of two veteran employees, Stanley B. Johnson, president, announced Aug. 17. Doran Nester is the son of Roy L. Nester, unit foreman who has been with the company for 25 yr; and Lowell Leach is the son of Waldron D. Leach, shop electrician and with the company 16 yr. *(See "Coal Men" photo on p 148.)*

All five coal mines of the Tennesse Coal, Iron & R. R. Div. of the U. S. Steel Corp. have received recognition this year for their outstanding safety performance, the second year in a row. The coal mines or their individual employees received 21 of the 30 Joseph A. Homles Safety Association awards made to the division, and three of the coal mines also are getting awards from the National Safety Council.

The 9,500 tons of American coal arriving in Great Britain Aug 23 reportedly was the first such shipment to come into England since the winter of 1951-52. Several more shipments are due in the coming months as a part of the government's efforts to avoid a shortage of household coal this winter.

Large terminal facilities will be constructed by the Island Creek Fuel & Transportation Co. on the Ohio River 15 mi east of Ironton, Ohio, at South Point, Ohio, and Kenova, W. Va., across



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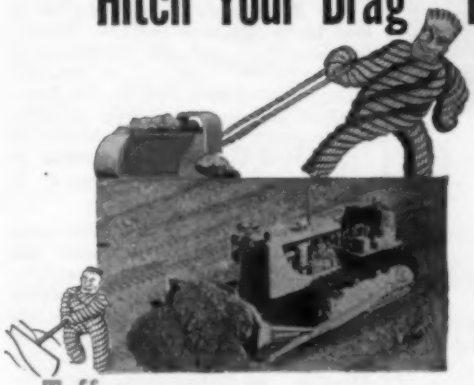

Tuffy Dozer Rope Designed to take the punishment of small winch drums and small sheaves . . . the shock of blade manipulation under toughest going! Mount a 150 ft. reel—avoid wasting rope.

Tuffy Scraper Rope Flexible enough to withstand sharp bends . . . stiff enough to resist looping and kinking when slack . . tough enough to resist drum crushing!

You need not "baby" a Tuffy Dragline when you hit tough terrain. The strength is there to pull it on in and come up with a bonus load almost every time you cast.

And, too, Tuffy Dragline is so constructed with larger wires on the outer lays as to present more surface area of tough steel to stand abrasion longer.

But there is even more to the combination which lets you come out with fewer dragline replacements. The inner structure of Tuffy Dragline is engineered to contribute greatly to the overall strength and at the same time maintain the flexibility needed in casting the bucket.

Your Union Wire Rope distributor can supply you with these longer running draglines for every digging purpose without complicated specifications. Simply order Tuffy Draglines. That plus the diameter and length writes the strongest dragline specifications possible.

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9-part, machine braided wire fabric construction is extra flexible, extra strong . . . knots or kinks are readily taken out without material damage.

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A unique 3 strand non-collapsing wire rope fortified against drum crushing, abrasion and shock loads.

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COAL MEN ON THE JOB . . .

ROGERS COUNTY COAL CORP., Claremore, Okla.: F. D. Morgans (right), blasting foreman, with T. H. Michell, district representative, E. I. duPont de Nemours & Co.

the river. The new terminal will handle both high- and low-volatile coal mined in West Virginia and eastern Kentucky, on the N&W, and will have a capacity of some 500 cars.

The Philadelphia & Reading Coal & Iron Co. will be the exclusive licensee for the manufacture and distribution of "Bonnie Burns Briquets," a new anthracite-derived fuel sold in cellophane-wrapped packages for all types of grilles and fireplaces. It was initially introduced last May by the Anthracite Institute as the first packaged fuel developed by its laboratory.

More than 40% of Russia's coal combines and coal-cutting machines and "about half" of its loading machines were not used during the first quarter of 1954 because of poor production organization, it was reported by *Pravda*, the official Communist Party newspaper in Moscow. In another item, *Pravda* reported that the Coal Ministry met its production quota for the first half of 1954 by 101%, an output 8% more than in the same period of 1953.

Sales of coal mined in Alberta, Canada, are expected to show improvement as a result of newly enforced laws to tighten compliance with official standards of coal quality. The new law, the only one of its kind in Canada, forces Alberta producers and dealers to meet ASTM standards as approved by the provincial and federal governments and coal producers.

The first uranium mine in the eastern United States was opened in July by the Lehigh Coal & Navigation Co. near Jim Thorpe (formerly Mauch Chunk), Pa. The AEC has made an agreement with LCN for all the uranium produced. While presence of deposits in the area has been known for some years and exploration by the AEC and various anthracite and other companies has previously been reported, the LCN mine is believed to be the first commercial operation in the region.

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THE "IP"* LUBRICANT

PROVES PROFITABLE FOR THE TOUGH LUBRICATING JOBS

IN MECHANIZED MINING

Specifically compounded for your particular needs, LEADOLENE KLINGFAST is a tough, lead-based lubricant with a great variety of applications in the coal industry. This lubricant . . . with its "indestructible pH-ilm" making possible efficient lubrication even in the presence of coal dust and other abrasive factors . . . regularly reduces costs and extends equipment life on the toughest of applications.

We suggest you read the accompanying case histories to see what LEADOLENE KLINGFAST has done for others . . . then describe your toughest lubrication problem and Brooks will prepare a sample designed to give best service on that particular application.

*I.P. . . . "Indestructible pH-ilm," capable of withstanding pressures up to 50,000 psi.

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Executive Offices and Plant.....CLEVELAND, OHIO
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Case Studies

WIRE ROPE

A certain strip mining shovel, on which a conventional lubricant was used, had a wire rope failure on an average of every 18 days of service. A single application of KLINGFAST extended the service to a record of 31 days.

CORROSION PROTECTION

Due to sulphurous and other extremely corrosive agents used in quenching, the steel work in and around the quencher station of by-products coke plants is subjected to most severe corrosion. In one specific application maintenance costs were particularly high since no paint would protect for as much as a year. A grade of KLINGFAST, which was brushed on as a protector coating, gave in excess of two years of protection.

OPEN GEARS

A motor-operated hoist equipped with double herringbone cut teeth pinions and gears is used to operate 5-ton clam shell buckets at a large coke plant. Although a high grade plastic compound was applied every 24 hours, it failed to prevent wear of the gearing. On this application, which includes intermittent operation, reversing, high speed, severe shock and contamination from coal dust, KLINGFAST is applied only once every 10 days, and costs 25% less per pound than the lubricant it replaced.

DIPPER STICKS

Due to excessive moisture and other conditions, a company had to lubricate their shovel dipper stick once each day. Since KLINGFAST has been adopted as their standard, lubrication application now is necessary only once every three weeks.

MINE EQUIPMENT

Mining machines are quite a problem in lubrication because of water, dust, shock, vibration, speed and excessive loading. LEADOLENE fluids have proven a great advantage in the gear cases of loaders in one large mine because of repellence of water, adhesiveness to prevent excessive leakage, high film strength to prevent wear of gears and worms and other characteristics for this tough job. Lubricants take a terrific beating and LEADOLENE is one that stands up and takes it.

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Preparation Facilities

Reidinger Coal Co., Paxinos, Pa.—Shipment by Deister Concentrator Co. of one No. 7 SuperDuty Diagonal-Deck coal-washing table for cleaning No. 4 buck anthracite.

Richwood Sewell Coal Co., Summerville, W. Va.—Shipment by Deister Concentrator Co. (to Olgebay, Norton & Co.) of six No. 7 SuperDuty Diagonal-Deck coal-washing tables, and one Concenco revolving feed distributor arranged for 6-way feed.

Compass Coal Co., Chieftain No. 2 mine, Dola, W. Va.—Contract closed with Fairmont Machinery Co. for coal-cleaning plant, including Chance cone to wash 5x⅜-in coal and Deister Super-Duty coal-washing tables to wash ⅜x0, with clean coal from tables centrifugally and thermally dried; R-O-M capacity, 300 tph.

New Books for Coal Men

German Mining Methods

Horizon Mining, by C. H. Fritzsche and E. L. J. Potts. This study was prepared as a guide for British mining engineers following a period of intensive study of German methods employing horizon mining, with the thought that the system might be adapted to some British operations with steeply pitching seams. Exhaustive text and profuse illustrations. *614 pp. 7x9½-in; cloth. $17, The Macmillan Co., 60 Fifth Ave., New York 11, N. Y.*

New Mining-Methods Textbook

Introduction to Mining, by B. Stoces. A comprehensive account of mining methods, machines and practices, suitable for beginners and advanced students and engineers and reflecting European experience and background of the author. *Two volumes: vol 1, Text, 711 pp; vol 2, Illustrations, 363 pp. 6¼x8½-in; cloth. $10 (two volumes), The British Book Centre, Inc., 122 East 55th St., New York 22, N. Y.*

Better Industrial Health

Transactions, 18th Annual Meeting, Industrial Hygiene Foundation. Included papers deal with medical, legal, medical-legal, engineering and chemical-toxicological aspects of industrial hygiene. *187 pp. 6x9-in; paper. $3, Industrial Hygiene Foundation of America, Inc., Mellon Institute, 4400 Fifth Ave., Pittsburgh 13, Pa.*

Association Activities

Illinois Mining Names Wilson

George M. Wilson, geologist in charge of the Educational Extension Div. of the Illinois State Geological Survey, has been appointed by the executive committee of the Illinois Mining Institute as secretary-treasurer of the organization. Mr. Wilson succeeds B. E. Schonthal, who retired in July after 25 yr of service in the post.

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INTERCHANGEABILITY
you'll like

You Can Use Wilmot Rivetless Chain for Any Replacement

As the designers and originators of rivetless chain, Wilmot offers the largest choice of sizes available. Any one of them will interchange with the same number of any other chain. In the Wilmot catalog of rivetless chain conveyors you will also find by far the largest listing of chain attachments. Because of this more complete choice of conveyor parts, an increasing number of leading firms are depending on Wilmot for all replacements. Chain furnished in pitches from 3" to 10½" and in working loads from 3,000 to 130,000 lbs., of drop-forged steel, alloy, or cast chrome-manganese. Sprockets, traction wheels, flights, take-ups, shafting, bearings and trough in cast iron, ductile iron, carbon or chrome-manganese steel. You can economise on spare conveyor parts by depending on Wilmot for all replacements.

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KNOXVILLE, TENN. -- Crowell Engineering & Sales Co., 3045 Sutherland Ave.

PITTSBURGH 16, PA. -- Harold C. Lusk, 3045 W. Liberty Ave.

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Among the Manufacturers

Joy Executive Vice Pres.

Joy Mfg. Co., Pittsburgh, has elected John Lawrence executive vice president. As a part of his new post, Mr. Lawrence will give special attention to Joy's efforts toward further diversification of the company's product lines. Joining the company in July 1951 as vice president of manufacturing, he was named vice president of manufacturing and engineering in April 1953. His prior experience includes 7 yr with SKF Industries, Inc., where he served as vice president, and 10 yr with Jones & Lamson Machine Co., where he was factory manager. The company also has announced that Walter J. Pilarski has assumed additional responsibilities as manager of its Contract Core Drilling Div., following the recent death of J. B. Martin. Mr. Pilarski has been associated with the department as Mr. Martin's assistant since 1937. Frank M. Capp has been named manager of sales engineering, Core Drill Div., succeeding Mr. Martin in this position. Mr. Capp joined Joy in 1941 and has been assistant manager of sales engineering in the division since 1946. He has been succeeded by James M. Barrett.

Ashe to Allen-Sherman-Hoff

Donald G. Ashe has joined the engineering staff of the Allen-Sherman-Hoff Pump Co., Wynnewood, Pa., effective Aug. 1. metallurgical engineering graduate of the Colorado School of Mines, Mr. Ashe formerly was associated with the Cananea Consolidated Copper Co., Sonora, Mexico. In his new position, Mr. Ashe will be concerned with the application of sand pumps to mining throughout the world.

American Mine Door Expands

American Mine Door Co., Canton, Ohio, has announced the addition of a new department to the organization known as the research and development branch. Headed by Glenn D. Gurney, with the company for 22 yr and director of engineering, the new department will concern itself with research on new products as well as improvements on those now manufactured.

Pangborn Celebrates 50 Year

Pangborn Corp., Hagerstown, Md., last month announced a program of events for Sept. 1-2, in celebration of the 50th Anniversary of the founding of the corporation. An Open-House at the Pangborn plant to which the public is invited, marking the official anniversary date Sept. 1, will be followed by the unveiling of a tribute to Thomas W. Pangborn and his brother, John C. Pangborn, founders of the corporation, as a gift from all employees. Tuesday evening Sept. 2 will be Employees' Night, with a special program of entertainment.

Jeffrey Shifts District Men

Several promotions in district office personnel have been announced by J. E. M. Wilson, vice president in charge of sales, The Jeffrey Mfg. Co., Columbus, Ohio. Walter J. Hulsey, a sales engineer with the Birmingham district office, has been named district manager, Conveyor Div., there. Joining him as sales engineer in that office is J. Thomas Berg, from the home office. Howard S. Davies, former Conveyor Div. district manager in the Chicago district office, has been moved to a similar post in Pittsburgh. Replacing him in Chicago is James B. Green, for a number of years assistant to the chief engineer at the Jeffrey home office. Being transferred from Pittsburgh are E. E. Balduff and Travers W. Nelson, both sales engineers, Mr. Balduff to Orlando, Fla., and Mr. Nelson as manager of the district office in Jacksonville, Fla. Vernon L. Ekblad, former sales engineer in the General Engineering Sales Div. at Colum-

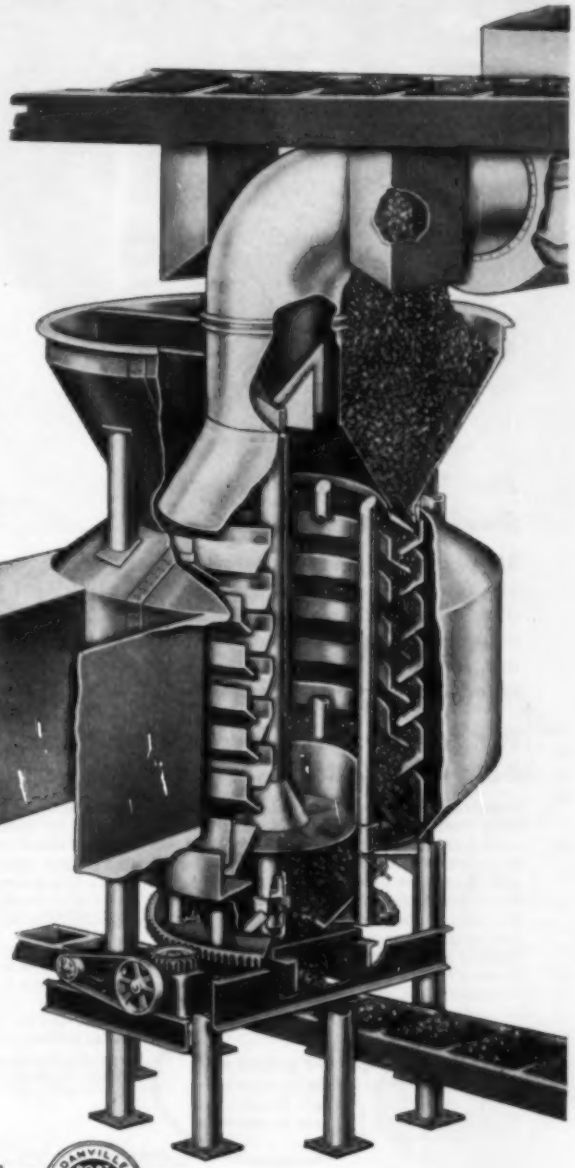
COAL MEN ON THE JOB . . .

BELL & ZOLLER COAL CO., West Kentucky Div., Madisonville, Ky.: Stanley Williams (left), mine manager, Oriole mine; Oliver Whitefield, welder, Louis Stanley, mechanic, and George Blalock, mine foreman, Moss Hill mine.

Baughman

DRY up to 60 tons of COAL per hour in one pass...

VERTI-VANE THERMAL COAL DRYER



AT LOW INITIAL COST... LOW OPERATING COST, the Baughman Verti-Vane Drying Unit delivers a uniformly dried and well-mixed product with practically no degradation.

Each unit is designed for capacities ranging from 15 to 60 tons per hour, and handles all coal sizes from 1½" down. Reduces surface moisture to approximately 2% in a single, continuous operation. No re-run is ever necessary.

A minimum of moving parts and slow-speed operation tend to eliminate shift breakdowns and keep replacement costs to a minimum. Controls are easily adjusted for various feed conditions so that operation of the unit requires very little attention.

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Stop Breakage Losses with

HOLMES LOWERING SPIRALS

Eliminates droppage that degrades your coal. Saves wear and tear on bins. Costs nothing to operate (gravity operated). Centrifugal force is utilized to hold coal on spiral . . . inside edge or "lip" on spiral is unnecessary . . . allows coal to slide gently off and spread evenly upon reaching peak of pile. Coal flow on spiral is automatically controlled and remains within "safe" speed limits regardless of distance of travel.

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Manufacturers of: SHEAVES, TIPPLE EQUIPMENT, CAGES, SKIPS, LOWERING SPIRALS, CAR PULLERS AND RETARDERS, DRYERS, LABORATORY CRUSHERS, HOISTS, VIBRATING SCREENS, DUSTOLATORS.

bus, has taken a similar position in the Houston district office. Robert F. Farrell has become a sales engineer in the Columbus district office, replacing Robert D. Henning, who has moved to a similar post in the home office Products Engineering Sales Div. Robert M. Dunn has become associated with the Knoxville district office in a sales engineer capacity. George S. Kepley has been transferred from coal preparation engineering sales in the home office to the Pittsburgh district office, as has been Edward G. Braun, former sales engineer with the Buffalo district office.

Leschen Names Sales Head

Leschen Wire Rope Div., H. K. Porter Co., Inc., has named L. Jack Clarke general sales manager. Mr. Clarke, who has served Leschen as field representative in the New Orleans area and as manager of the New York sales district, will make his headquarters at the division's main offices in St. Louis.

Roebling Division Heads

John A. Roebling's Sons Corp., subsidiary of Colorado Fuel & Iron Corp., Trenton, N.J., has named Edwin F. Whitehill Cleveland district manager for the Wire and Cold Rolled Products Div. Joining Roebling as a woven-wire fabrics sales representative, Mr. Whitehill transferred to the firm's wire mills at Roebling, N. J., serving 12 yr in various capacities. Robert J. Cole has been named Pacific Coast manager of the firm's Construction Materials Div. Mr. Cole, recently on leave from Roebling to serve as president of the Pointer-Willamette Co., Edmonds, Wash., has been associated with the Roebling organization since 1923 and at one time was manufacturing manager of the Wire Rope Div.

G-E Promotes Helm

General Electric Co. has named James D. Helm sales manager for mobile communication equipment and special accounts, with headquarters at Electronics Park, Syracuse, N. Y. He will direct the national sales of G-E two-way radio equipment. Joining G-E in 1943, he was appointed a sales engineer in 1945, sales manager for special industrial accounts in 1951, and recently sales manager of special accounts.

Mahon Expands Facilities

The R. C. Mahon Co., Detroit, has just completed another expansion program to meet the space requirements of some of its rapidly growing divisions. With the latest addition of some 130,000 sq ft of factory space and 20,000 sq ft of office space, the company now has 1,300,000 sq ft of production area and 132,000 sq ft of offices, all constructed since 1942. The company also maintains a sales-engineering office in Chicago and has sales representatives in 95 cities throughout the country.

Gorman-Rupp Names Salesmen

In line with its program of expansion and close factory-dealer representation, Gorman-Rupp Co., Mansfield, Ohio, has named Ted C. Bauck district representa-

an ACCO product

American Cable "Green Strand" Wire Rope

What Wire Rope Do You Use on Your Carrier Scrapers?

• A complete description of a scraper cable is as long as your arm. But all you have to remember, if you are buying American Cable, is simply: TRU-LAY Streamlined Scraper Cable. And here's what you get, and why—

6 x 25 Flattened Strand—This means six strands of twenty-five wires each wound around triangularly shaped wires in the center of each strand. One flat side of the center wires of each strand faces out providing a relatively flat surface on the strand. The outsides of the six strands together make a smoother surface which gives the rope a much better bearing area against small sheaves and drums.

Independent Wire Rope Core—This adds considerably to the rope's breaking strength, and provides a solid steel core which keeps the rope from pulling down or flattening out on the small sheaves of a carrier scraper.

Lang Lay—When the wires in the strands are laid in the same cross-direction as the strands in the rope, the rope is Lang Lay. This makes the rope last longer because more of the outside wires are exposed to wear. It also makes the rope withstand more bending because of the helix of the wires. The crankiness of Lang Lay is removed by American Cable by preforming.

TRU-LAY Preformed—American Cable's Streamlined Scraper Cable is preformed to make it handle easier and last longer in bending around small sheaves. When wires do break, they stay in place instead of barbing out to slice hands and snag clothing.

Improved Plow Steel—That's what TRU-LAY Preformed is made of. The wire in this all-steel wire rope has an average tensile strength of 260,000 pounds per square inch. Look for the *green strand* which identifies this strong wire rope.

Just ask for TRU-LAY Streamlined Scraper Cable next time and every time you need rope for your carrier scrapers. You can also use it for the blade rope on your bulldozers. Your American Cable distributor stocks it and can give you quick service. Call him today or write our Wilkes-Barre, Pa., office for further information.

ACCO

TRADE MARK

American Cable Division

AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

plus ACCO Registered Wire Rope Slings

COAL MEN ON THE JOB . . .

PREPARATION EXPERTS: I. C. Trogdon (left), superintendent of No. 1 cleaning plant, Amherst Coal Co., Amherstdale, W. Va.; and C. G. Martin, preparation foreman, Lorado Coal Mining Co., Lorado, W. Va.

tive, covering a five state midwest area. Prior to joining the company 3 yr ago as a sales engineer and manager of industrial sales, Mr Bauck was associated with Goulds Pump, Inc., and Marlow Pumps, Div. of Bell & Gossett. Donald L. Sanders has been named district representative for Ohio, West Virginia, Virginia, Pennsylvania, New York and parts of Kentucky. Mr. Sanders formerly was with Clayton Mfg. as district manager of a four state area. Richard M. Fraser has been named district representative for northeastern United States.

Le Roi Appoints Sales Head

Le Roi Co., Milwaukee, Wis., has appointed James R. Harwood sales manager of the Transo Div. Mr. Harwood was district representative for Le Roi Construction & Mining Div. in Ohio, Michigan and western Pennsylvania until late last year when he joined the Transo Div. as a sales engineer.

Femco Sales Engineer

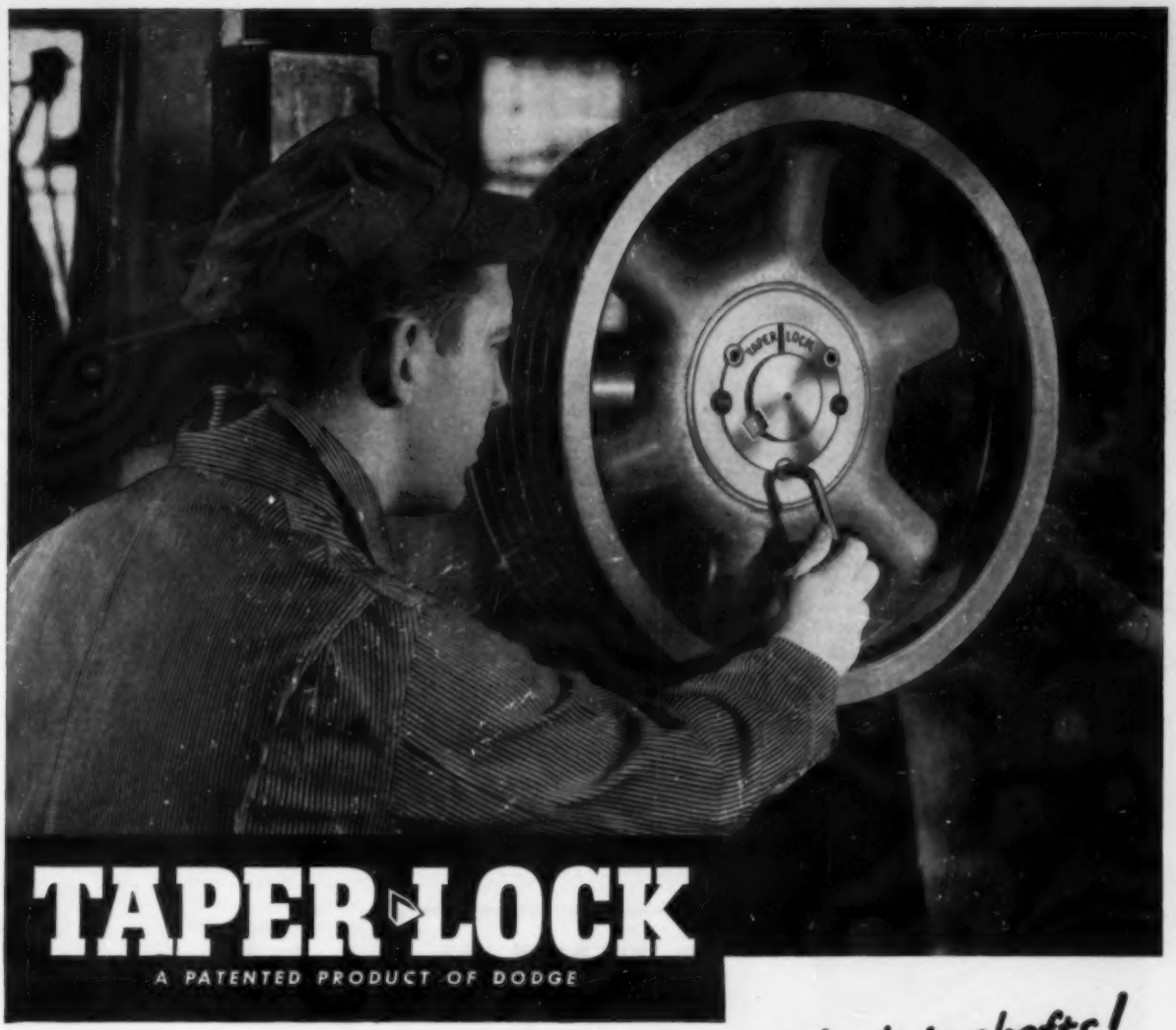
Femco, Inc., Irwin, Pa., has appointed Jack Helton sales engineer in West Virginia and the Carolinas, with headquarters in Bluefield, Va. Mr. Helton joined Femco in 1950.

Firth Sterling Moves Three

Carbide Div. of Firth Sterling, Inc., Pittsburgh, has promoted M. L. Backstrom, formerly chief engineer, to assistant sales manager. W. E. Montgomery, with the company for 20 yr, has been named to succeed Mr. Backstrom. John Gabrenas, with Firth Sterling since 1948, has been named assistant chief engineer.

Gardner-Denver Promotes

Gardner-Denver Co., Quincy, Ill., has named George W. Gutekunst, formerly district manager of Los Angeles, general sales manager, succeeding G. V. Leece, recently elected president. Mr. Gute-



TAPER-LOCK

A PATENTED PRODUCT OF DODGE

The simplest, surest means of mounting wheels to shafts!

Slip it on the shaft, line it up and tighten while sighting! Mount sheaves, sprockets, couplings, conveyor pulleys *quicker*—and more easily—with Taper-Lock bushings. A few twists of a hex wrench and Taper-Lock grips the shaft with the firmness of a shrunk-on fit. It comes off as easily, without shock to bearings or machinery. Bushing seats evenly along entire length of the hub—*wheels run true!*

Standardize on Taper-Lock. You save time and money and keep production rolling with these *interchangeable* bushings. See your Dodge Distributor, or write us for the full Taper-Lock story.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

THERE'S ONLY ONE TAPER-LOCK, THE BUSHING THAT MOUNTS FLUSH!

Standardize, economize with Taper-Lock, the bushing that is interchangeable in Dodge sheaves, sprockets, couplings and conveyor pulleys. *More than 2,000,000 in use!*

DODGE

of Mishawaka, Ind.

DODGE MANUFACTURING CORPORATION, 3000 UNION STREET, MISHAWAKA, INDIANA

kunst joined the company's sales force in 1937 and was transferred to Los Angeles in 1947. Charles M. George, with the company for 25 yr, has been appointed assistant to the president. In 1943, he was made assistant sales manager of industrial sales, was promoted to sales manager of that division in 1948 and since 1950 has been sales administrator. J. W. Gardner, recently elected to the board of directors, has been appointed administrative assistant. Joining Gardner-Denver in 1947 with the Los Angeles sales force, he has served in various capacities in the engineering department for the past 2 yr. B. P. Spann, with Gardner-Denver for 20 yr, and director of personnel for the past 8 yr, has been elected a vice president.

B-L-H Names District Manager

Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Lima, Ohio, has appointed John G. Watson district manager, with a territory including the Calumet district in Indiana, Illinois, Missouri, Kansas and lower Michigan. Mr. Watson joined the Lima organization in 1942 as a salesman in New York City. After service in World War II, he became sales manager, Trailer Div., Pressed Steel Car Co., Inc., Chicago, and has been sales engineer for Lima for the past year.

American Hoist Sales Head

American Hoist & Derrick Co., St. Paul, Minn., has appointed Ray J. Dervey general sales manager. Joining American Hoist in 1945, Mr. Dervey was promoted to district manager in 1946, in charge of the Pittsburgh office and territory. He succeeds John Carroll, now president of the firm.

Gar Wood Revamps Sales

Gar Wood Industries, Wayne, Mich., has announced a broad sales organization program centralizing the sales and marketing functions of all divisions of the corporation and of the National Lift Co., a subsidiary. E. B. Hill, vice president, has been appointed director of sales, advertising and export for all corporation products. Division sales managers, who formerly headquartered at plants, now report directly to Mr. Hill. The reorganization of the company's sales activities follows the completion of a new product development and improvement program and will make it possible to render better service to customers, the company reports.

Gustin-Bacon Appoints Two

Gustin-Bacon Mfg. Co., Kansas City, Mo., has appointed two new district managers: C. Weston Goode, southeastern United States; and H. J. Smith, Kansas City sales division. Mr. Goode, Atlanta sales representative for Gustin-Bacon since 1944, is in charge of the newly opened district office at 2025 Peachtree Rd., N. E. Atlanta. Mr. Smith, with the company since 1949 as representative in Louisville and St. Louis, will direct sales in Colorado, Wyoming, Nebraska, Kansas, Oklahoma, Arkansas, Texas Panhandle, southern Illinois, western Tennessee and northern Mississippi.

And For Your Information . . .

The Colorado Fuel & Iron Corp. has appointed John W. McAllister, administrative assistant to the president. Associated with CF&I for over 30 yr, Mr. McAllister was first employed in 1923 as a machinist helper in the company's coal mines and for the past several years has been executive secretary to the president.

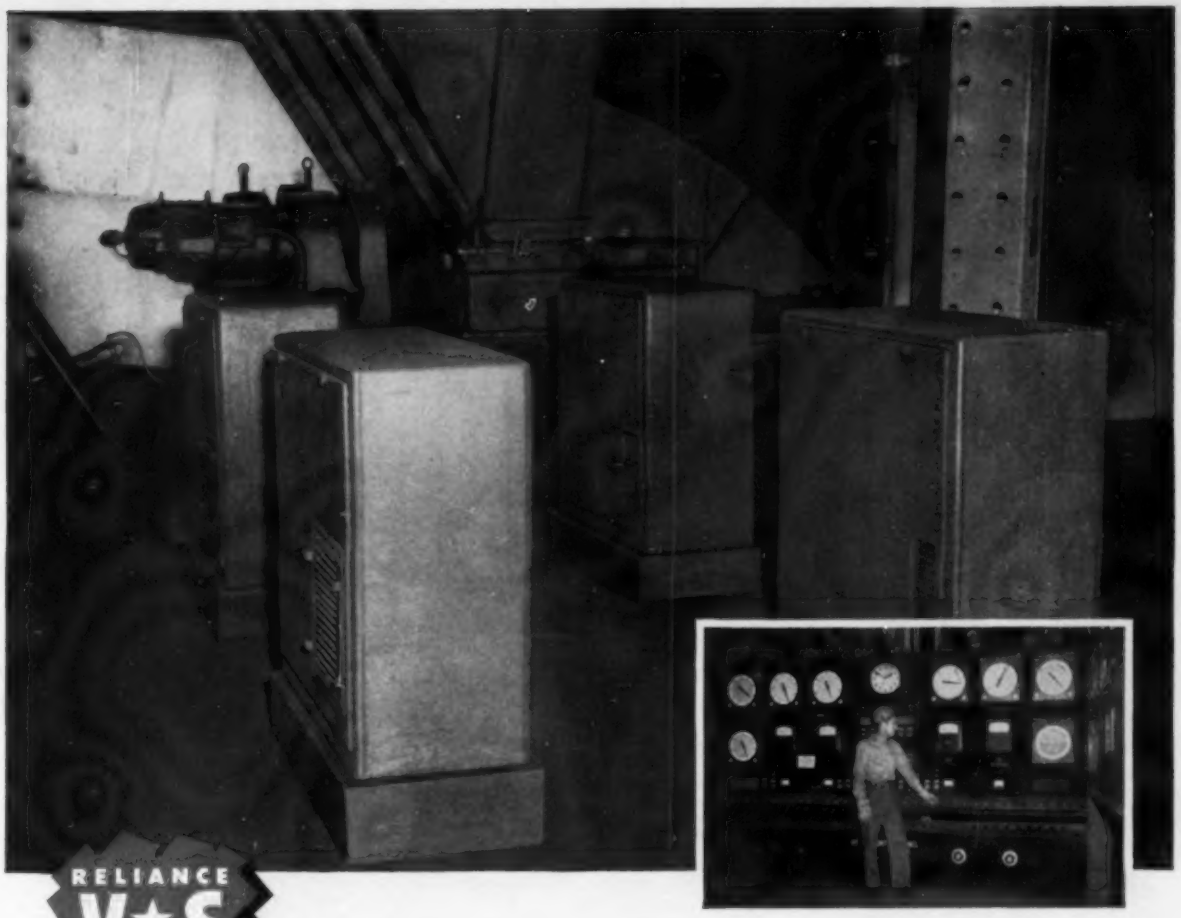
Westinghouse Electric Corp. has announced that a new multi-million-dollar sound laboratory and test center for the world's most powerful transformers will be built at the Westinghouse Transformer Div. plant, Sharon, Pa., ready for operation by early next year. Erected in a 200-ft-long extension of four existing assembly aisles at the Sharon plant, the test center will examine power transformers with a series of searching electrical tests before they are shipped to the customer. The sound laboratory, a building erected inside the over-all test building to test transformers up to 400 tons and rated at more than 500,000 kv-amp, will be constructed so that it will be virtually impossible for sound to enter or to leave the laboratory.

Clark Equipment Co., Benton Harbor, Mich., has appointed the following dealers for the Michigan line of products of its Construction Machinery Div.: Stith Equipment Co., Atlanta, Ga.; Berry Equipment Co., Memphis, Tenn.; Industrial & Contractors Equipment Corp., Cleveland, Ohio; Bode-Finn Co., Cincinnati, Ohio; Deeds Equipment Co., Rochester, Ind.; Bardale Equipment, Inc., Kirkwood, Mo.; Bert Smith Road Machinery Co., Enid, Okla.; and Construction Equipment Co., Ltd., Edmonton, Alberta, Canada.

The American Chain & Cable Co. has opened a warehouse and office at 2210 N. W. Roosevelt St., Portland, Ore. The third warehouse opened by the company on the West Coast this year, the 8,000-sq-ft Portland operation, serving Oregon, Washington and part of Idaho, will carry a complete stock of wire rope and wire rope slings, with I. L. Schobert in charge of wire rope sales. While no other products will be stocked at the Portland warehouse at the present time, orders of the company's American Chain Div., Manley Div., and Pennsylvania Lawn Mower Div. will be handled from this location. Robert L. Kleeb is in charge of sales for these divisions.

Acme-Hamilton Mfg. Corp., Trenton 3, N. J., has appointed William E. Wade technical director of the company, succeeding Norman J. Cyphers. Mr. Wade previously served for 19 yr in the Mechanical Goods Div. of U. S. Rubber Co. as a development engineer at its Passaic plant.

The Gifford-Wood Co., Hudson, N. Y., has appointed Henry J. Gagen western district manager, with headquarters in Chicago. Mr. Gagen has been in New York as sales engineer for the past 6 yr.



RELIANCE V★S DRIVE®

ALL-ELECTRIC ADJUSTABLE-SPEED DRIVE

assures uniform drying at optimum speeds on a 24-hour basis

In this ultramodern coal preparation plant, it takes only one man to run a multiple system of conveyors, furnaces and dryers. Operated from an integrated central station, a quartet of Reliance V★S Drives controls the 10- to 70-ton-per-hour output of four screw feed conveyors carrying ¼″ x 0″ coal to flash dryers.

The Reliance V★S Drives give the operator an infinite number of speeds to choose from. He can make fast, accurate adjustment when blending schedules change and drying temperatures vary. The result is quality coal delivered in the right amount and delivered on time—at low operating cost.

Whether you use or build machinery for above- or below-ground operation, Reliance motors and electric drive systems may solve a problem for you. A Reliance Engineer is ready to help, backed by almost 50 years' experience in the application of electric drives. Call your nearest Reliance Sales Office, or write us direct for Bulletin D-2311. D-1404

RELIANCE ELECTRIC AND ENGINEERING CO.

1055 Ivanhoe Road, Cleveland 10, Ohio • *Sales Representatives in Principal Cities*

"Yes, I agree... we should stick to coal," said the President.

PLANT ENGINEER: "On the basis of delivered BTU's any other fuel would cost us considerably more than coal."

PURCHASING AGENT: "Coal is the one fuel you can store in large quantities safely and economically. It always gives me a comfortable feeling to know there is at least a month's supply here in the bins."

SUPERINTENDENT: "Since we put in the new stoker and automatic ash removal we haven't had a bit of trouble with dust or smoke; and our boiler room labor cost is down to practically nothing."

SALES MANAGER: "One of our talking points is the uniform finish which comes from an even oven temperature. I hate to think what might happen if we changed to an on-agr in-off-again heat."

PRESIDENT: "There being no dissenting vote, we will stick to coal."

Bring your fuel problems to C & O

As the world's largest carrier of bituminous coal, the C&O is intimately familiar with every phase of coal use. We have a large staff of experts who will gladly help you to locate the coal best suited to your needs; to help you use it most efficiently; to help get it to you promptly.

Write to:

Coal Traffic Department
Chesapeake and Ohio Railway
2119 Terminal Tower
Cleveland 1, Ohio

COAL
FUEL OF THE FUTURE

Chesapeake and Ohio Railway

World's Largest Carrier of Bituminous Coal

NEW Seals are Essential . . . NEW Seals are a Must !

ALWAYS Buy BEARING SEALS from Bearings, Inc.

When Bearings are Removed – When Bearings are Replaced – Install NEW Seals!

For longer bearing life and better service, always use seals when repairing drills, cutting machines, loaders of all types, conveyors, mine cars and locomotives; in air cleaners, classifiers, driers, crushers, screens and other equipment. Order by the seal manufacturer's number or the equipment manufacturer's part number . . . either way, you'll get the seals you need in a hurry and the price will be right!

We carry seals from the three leading manufacturers . . . in stock at our branches in the sizes and quantities that allow us to promise immediate delivery with no freight charges!

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INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute
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Gentlemen:
Please see that I get full information on the seals mentioned in COAL AGE.

Name_____
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Address_____
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FOR DAY-IN DAY-OUT OPERATION THAT CUTS DOWN TIME IT'S

ROCKBESTOS AVC®

Jeffrey eight-wheel, 4 motor, trolley locomotive, available in 27, 37 and 50 ton models — wired with Rockbestos A.V.C.

ORDER FROM THESE JOBBERS SPECIFY "ROCKBESTOS A.V.C."

JENKINS, KY.
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LOGAN, W. VA.
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Westinghouse Electric Supply Co.
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Upson-Walton Co.
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Top mining machinery builders, such as the Jeffrey Manufacturing Company, give you the added bonus of Rockbestos A.V.C. internal motor wiring as standard equipment in their products.

It's the cable with *permanent insulation*. Built to stand up and give the kind of trouble-free performance you need, under toughest conditions, for years and years and years!

High temperatures won't dry out or crack Rockbestos A.V.C. Exposed to oil and grease, it won't bloom or rot — and it fits bushings *right*.

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NEW HAVEN 4, CONNECTICUT

NEW YORK • CLEVELAND • DETROIT • CHICAGO
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Gives you MORE POWER... Gives you MORE VALUE!

Only a Dodge truck offers these exclusive years-ahead features . . . provides so much extra worth for the low price that you pay!

NOW YOU CAN GET

the world's most powerful low-tonnage truck engine . . .

NEW 145-HP. POWER-DOME V-8

for ½- through 1-ton pick-ups, panels, and stakes

☆ Greatest power line-up

Famous Power-Dome V-8's with unique dome-shaped combustion chambers for top power and efficiency! Full line of thrifty time-proved 6's, too! 6 great engines in all—103- to 172-horsepower!

☆ Easiest handling

39¾ turning angle—for sharpest turning, easiest parking of any truck! Plus new gear-before-axle steering system that helps absorb road shocks, cuts driving fatigue to a minimum!

☆ Most comfortable cab

Widest, roomiest cab interior of them all—with 61¾" of hiproom, 58¾" of shoulder-room! Deepest easy-chair seat—with 86 soft super-cushion coil springs!

☆ Best Visibility

Biggest windshield in the popular truck field—951 sq. in. in size! Most total vision area, too, with a full 2261 sq. in.! You see more from every angle in a Dodge truck!

☆ Plus biggest savings

Power-Dome V-8 design gets more miles from every gallon of regular gas, stretches your fuel dollars! And Dodge truck quality engineering saves you even more money in long life, low maintenance!

SEE YOUR DEPENDABLE DODGE TRUCK DEALER TODAY!

Added proof...

that there's a better deal for the man at the wheel . . . with new

DODGE "Job-Rated" TRUCKS

Designed for Greater Range and Capacity

LIMA 2400

This big machine is engineered and constructed for extra-heavy duty. It has met with enthusiastic acceptance, and is setting new performance records on coal stripping and other mining operations.

Features include: "precision" air control of all operating functions; anti-friction bearings at all vital bearing points including drums, cone rollers and hook rollers; large diameter drums for maximum cable economy; truck base and rotating base of heavy one-piece annealed cast steel; extra sturdy construction; easy accessibility of all parts requiring lubrication or maintenance; torque converter power take-off standard equipment for shovel operation; heavy-duty diesel power plant—plus many other features for maximum performance and availability.

The LIMA line includes Shovels ¾ to 6 yards, Cranes to 110 tons, and Draglines, variable. Offices in principal cities of the world.

LIMA Rubber Mounted Cranes are Available up to 45 Tons Capacity

6-YARD SHOVEL
•
5-7-YARD DRAGLINE
•
110-TON CRANE

LIMA
SHOVELS • CRANES
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BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
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CENTRIFUGAL COAL DRYERS...

FOR DRYING COAL

the Economical Way!

A C-M-I Centrifugal Coal Dryer may be the efficient, profitable and economical answer to all your coal drying problems . . .

The continuous centrifugal drying method, as perfected by C-M-I, is far less expensive than heat drying when used for preliminary dewatering and may, in many cases, eliminate entirely the need for costly heat drying. With typical American ingenuity, C-M-I has developed the original Elmore patents of over forty years ago to a peak of previously undreamed of efficiency. In fact, modern C-M-I Dryers not only save money . . . *they actually earn money!* Every year C-M-I Dryers reclaim thousands of tons of marketable coal from slurry ponds . . . paying for themselves in this one operation alone in a remarkably short time!

C-M-I, manufacturers of the world's finest centrifugal dryers, maintains a complete laboratory with facilities to solve individual dewatering problems. This service is available to all in the coal industry, entirely without obligation, of course. Send a description of your problem and your requirements to C-M-I; we'll be most happy to recommend an economical and practical solution.

C·M·I Centrifugal DRYERS

CENTRIFUGAL & MECHANICAL INDUSTRIES

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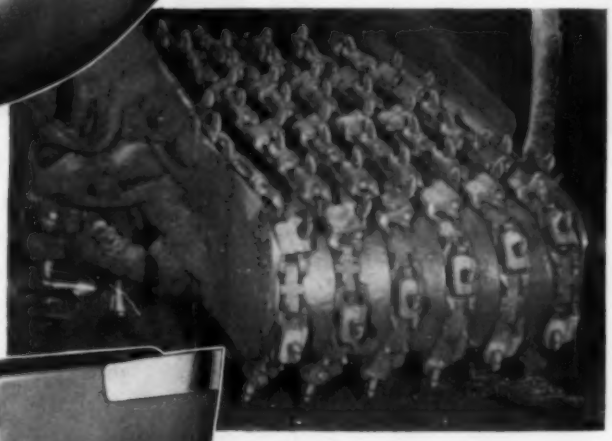
Complete Installation

of CINCINNATI CUTTERCHAINS and tungsten carbide tipped CINIDE BITS...

STRAIGHT SHANK

Conventional, easily removed, straight shank, Cincinnati CINIDE BIT...a popular rugged performer.

For greater efficiency where CONTINUOUS MINING MACHINES are being used



FIRST TO PRODUCE A TAPERED SHANK CINIDE BIT

Locks firmly and tight in bit block . . . gaining in popularity.

Specialists in Heat Treating as well as pioneers in the development, design and manufacture of a complete line of coal cutting equipment, Cincinnati Mine offers the industry an outstanding combination of tungsten carbide tipped CINIDE BITS and CUTTER CHAINS. Our long experience in heat treating is especially important in the manufacture of highly stressed bits where failure due to inadequate heat treatment can be extremely costly. In design, all pressure surface bearings are machined...an important factor in extending life of the chain and reducing bit loss. Should you have a special cutting problem, our experience and help is yours for the asking.

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CINCINNATI 25, OHIO

TOP PUMPING PERFORMANCE

day after day!

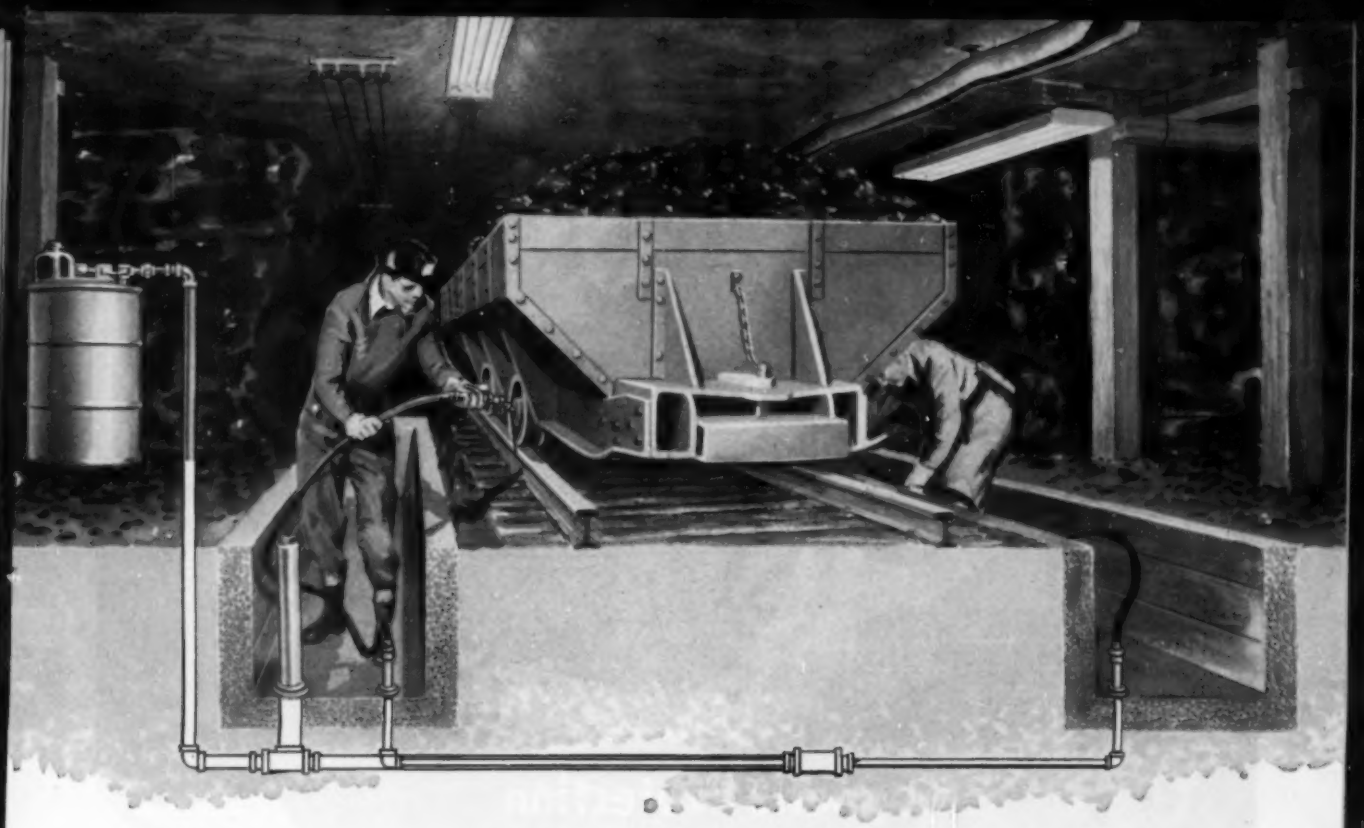
Rex Speed Primer Pumps assure top priming and pumping efficiency *day after day* . . . on the highest lifts . . . under the toughest conditions. With the rugged Rex you get *maximum* capacities whether you're pumping clean or muddy, debris-filled water.

When the corrosion and abrasion of mining service causes wear to working parts . . . reducing pump efficiency . . . new pump operation can be restored by a simple adjustment of the patented Rex Adjustable Air Peeler . . . an exclusive with Rex. So your Rex Speed Primer is as good tomorrow as it is today.

Get all the details on this and other exclusive Rex features from your local Rex Distributor or write Chain Belt Company, 4786 W. Greenfield Ave., Milwaukee 1, Wisconsin.

CHAIN BELT REX COMPANY

MINING PUMPS



Here's a way to help a coal mine show a profit!

Alemite Barrel Pumps cut mine car lubrication time in half —extend bearing life—slash maintenance—boost tonnage!

These two pits, above ground or below, allow mine cars and locomotives to be lubricated almost "on-the-go." Important time savings are the immediate result, but even more important are increased bearing life—the savings in downtime and maintenance! And tonnage goes up because the car stays on the job, where it belongs!

Simplified system pays for itself—FAST! Installation is easy, and savings quickly pay the modest cost. From the Alemite Barrel Pump, lubricant is piped to the two outlets equipped with Alemite Control Valves. Operators have finger-tip control of lubricant where they need it—right at wheel level. Lubricant stays "refinery clean"—free of dust and grit!

The powerful "Heart of the System" is the Alemite Barrel Pump. It has the power to completely flush out old grease and grit. To supply the bearing with fresh, effective lubricant—in seconds! Alemite Barrel Pumps can handle one or many outlets, are available in a wide range of types and sizes to *exactly* fit your needs.

A trained Alemite engineer will be happy to explain this and other ways modern lubrication methods can save you money—help MAKE you money! And this service is absolutely FREE to you! Simply write Alemite, Dept. E-54, 1850 Diversey Parkway, Chicago 14, Illinois, for FREE information!

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ALEMITE

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Lubrication Methods that Cut Maintenance Costs

When you specify a powerful, solidly built Stearns Electro-Magnetic Pulley for tramp iron removal, you get protection that's tailored exactly to your plant and product. Here's why:

First, Stearns magnetic specialists study every aspect of your installation . . . size of conveyor belt . . . speed of belt travel . . . size of material . . . depth of material . . . atmospheric conditions . . . available space . . . and many others. Then, Stearns interprets these factors and selects the magnetic pulley that will provide you with maximum plant protection and product purification.

Stearns offers both permanent and electro-magnet pulleys. A word from you places nearly 40 years of research and engineering experience at your disposal. Write for bulletin 303B-1 today.

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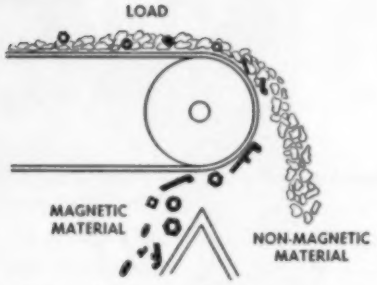


Diagram showing how Stearns magnetic pulley removes tramp iron.

Check these Advantages

1. **DEEP MAGNETIC FIELD** provides maximum pull to remove deeply imbedded tramp iron.
2. **SOLID MAGNET BODY** — one-piece casting. No tie rods to loosen.
3. **AIR-COOLING VENTS** provide for fast heat dissipation — keep magnetic strength high.
4. **INSULATED COIL WINDINGS.** Baked on insulating varnish is covered with spun-glass fiber, then sealed with bakelite varnish. We'ded, not soldered coil joints.
5. **STEEL COIL COVERS** eliminate dead spots — distribute magnetic force lines over pulley face.
6. **COLLECTOR RINGS, BRUSH HOLDERS AND HOUSING.** Bronze collector rings are bakelite-insulated, machine-fitted to shaft and enclosed in shock-resistant, cast-iron housing.

MAGNETIC EQUIPMENT FOR ALL INDUSTRY

STEARNS MAGNETS

STEARNS MAGNETIC, INC. 661 S. 28th St., Milwaukee 46, Wis.

This simple idea saves money in V-Belt Costs

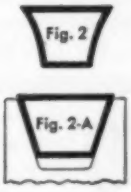
You can prove it in two minutes!

To prove how the CONCAVE SIDES of GATES VULCO ROPES *save money*, just make this simple test—

Bend *any* V-Belt that has *straight sides* (Fig. 1) and—as the belt bends—*feel* the sides *bulge out* (Fig. 1-A). This out-bulge concentrates the wear at the points shown by arrows—and this naturally shortens the life of a *straight-sided* belt!

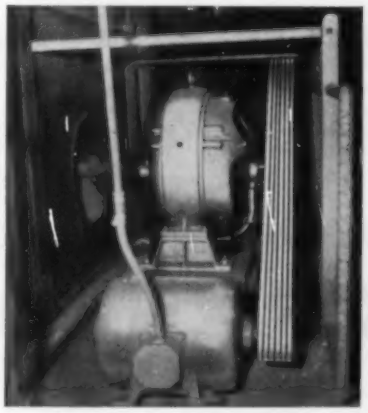
Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2)

(U. S. PAT. 1813698)



You find that the CONCAVE SIDES *fill out* and become perfectly straight. They thus press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the GATES VULCO ROPE—and this means *longer* belt *life* and *lower* belt *cost* for you!

When you buy V-Belts, be sure to get the V-Belt with the CONCAVE SIDES—the GATES VULCO ROPE!



Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

Gates

VULCO ROPE DRIVES

THE GATES RUBBER COMPANY
DENVER, U.S.A.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

CS-848

Parmanco

H-81-53

HORIZONTAL DRILL

Easily cuts drilling time

IN HALF

Completely Re-designed

- *with hydraulic feed*
- *horse power increased to 81 with "254" cubic inch engine*

Included in the new design is a sturdier frame, with the elimination of racks, pinions, and all mechanical power feed gearing. The four individually adjustable jacks make possible faster set-up and smoother drilling.

The H-81-53 drill is designed for drilling 5-6-8 inch holes to 100 feet or more. The greatly increased 81 h.p. engine in combination with the hydraulic feed makes possible the reduction of footage time by at least one half. All drive gears are totally enclosed. Power feed features direct hydraulic feed eliminating reduction gearing in hydraulic feed system.

This new drill—the very latest in design—is equipped with self-starter and generator, dual type front wheels, truck type rear axle with hydraulic brakes, and traction drive with both forward and reverse. Here is greater speed in retrieving augers and four rotating speeds and reverse for drilling and cleaning the hole. Here is accuracy and mobility. Here is the modern answer to faster, lower-cost drilling. Send for complete details.

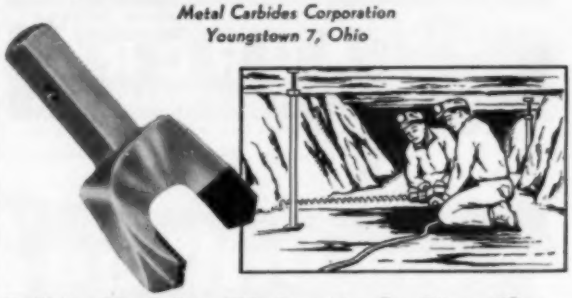
PARIS MANUFACTURING CO.

PARIS, ILL.

SUPERSET CORE BITS

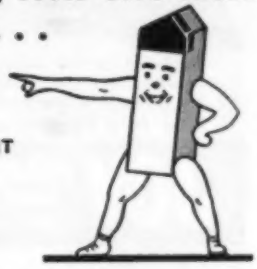
● Mining contractors, ore prospectors, coal operators and construction firms are realizing tremendous savings by taking advantage of our **exclusive fabrication service!** Contractors send us the necessary diamond stones from their own stocks—we hand set them in a super-hard tungsten carbide crown and braze to the threaded steel blank. Hand-set bits assure the proper positioning of each diamond stone to achieve maximum cutting efficiency. The carbide matrix holds the diamond stones until entirely used up. These advantages mean lower drilling costs to you. We can also supply complete core bits or salvage the stones from used bits at nominal cost. Supplied in standard sizes EX, EXE, AX, BX, NX, etc.

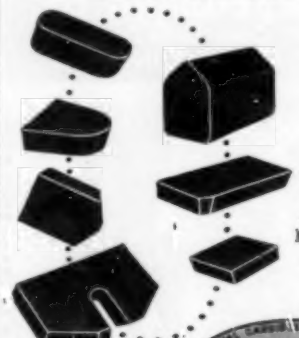
Metal Carbides Corporation
Youngstown 7, Ohio



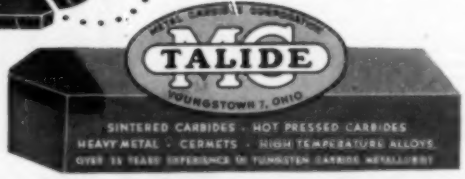
Talide Tips for Mining Tools Give These 3 BIG ADVANTAGES . . .

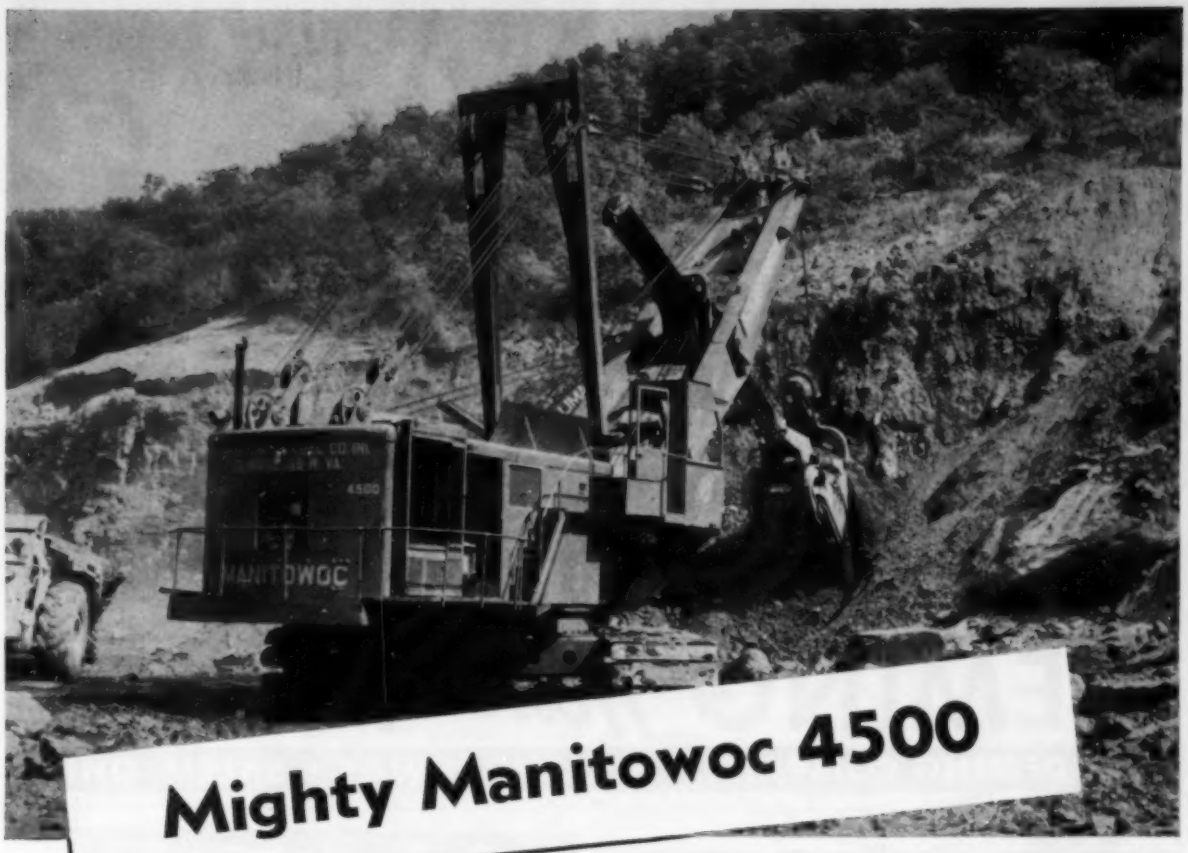
1. EXTRA STRONG
2. SUPER HARD
3. SHOCK RESISTANT





● A complete line of low-cost, high-quality Talide Tips is offered fabricators and users for tipping machine bits, rock bits, drill bits, roof bits and open-pit bits. All Talide Tips have a special surface finish that facilitates brazing. Non-standard shapes and sizes quoted on request.





Mighty Manitowoc 4500

Powerful Producer

Big Yardage on every mining operation when there's a Manitowoc 4500 on the job. More profits per shift—less down time—smooth, tireless operation day after day—that's what you look for in a dragline or shovel—and that's what strip miners all over the nation are getting from their Manitowocs.

Here's a 4500 shovel with a 40′ boom, 27′ sticks and 5½ yd. dipper stripping 60′ to 80′ of tough overburden for Grafton Coal Co., Clarksburg, W. Virginia, averaging 3500 yards per 8 hour day. A Manitowoc has the operating features to give you this kind of performance on every job—smooth, positive-action torque, converter, fast operating cycles, special design long-reaching booms, hi-lift shovels, complete diesel operation for traveling anywhere without a trailing cable or electric supply, wide pads and wide crawlers that mean lower ground pressure.

See and get the facts on Manitowoc before you buy your next shovel or dragline.

MANITOWOC

SHOVELS 1-5 YD. — Speed Crane — CRANES 18-100 TON

A 50 YEAR *Partnership*

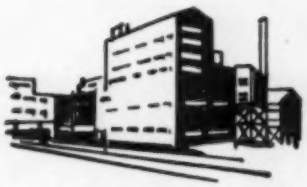
R AND S COMPANY

with the

Coal Mining Industry

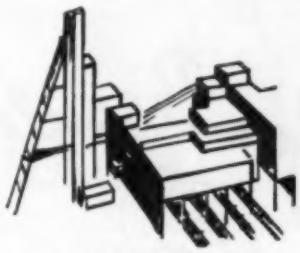
On September 26th, Roberts & Schaefer Company will have completed fifty years of such close association with the coal mining industry that we have come to think of it as a partnership.

These have been years of accomplishment, both for the industry and ourselves. The mining companies have worked diligently and consistently to provide a better product; we have worked with them to supply the preparation process best suited for their requirements. During these years R & S Coal Preparation Plants have been installed in major mines throughout the United States and in many foreign countries.



Each of these preparation plants has been designed with the exact equipment required by the individual mine. Roberts & Schaefer Company is able to supply its own Super-Airflow Cleaner for air washing, the Hydrotator and Hydrotator Classifier for wet washing, and Heavy Media Separators for difficult cleaning problems.

As a further service to the industry, full-size units of each of these methods have been consolidated in the R & S Pilot Plant at Harvey, Illinois and are available to test carload quantities under actual operating conditions to determine in advance the method required for consistent, low-cost preparation. An outside, unbiased laboratory report of all end products is then supplied with R & S recommendations.

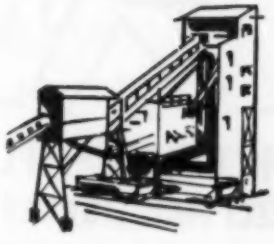


The establishment of this pilot plant is an indication of our confidence in the continued activity of the coal mining industry, and we look forward with assurance to another fifty years—and more—of working together to our mutual advantage and accomplishment.

ROBERTS and SCHAEFER COMPANY

130 North Wells Street, Chicago 6, Illinois

Henry W. Oliver Bldg., Pittsburgh 22, Pa.
254 West 54th Street, New York 19, N.Y.
P.O. Box 570. Huntington 10, W. Va.
P.O. Box 675, Hibbing, Minnesota
Foreign Department: International Mfg. & Equipment Co., Inc.
220 Broadway, New York 38, N.Y., U.S.A.



R & S Pilot Plant at Harvey, Illinois built and maintained for the sole purpose of testing coal cleaning methods under actual operating conditions.

it takes two

DISPLAY ADVERTISING

- AROUSES INTEREST
- CREATES PREFERENCE

DIRECT MAIL

- GETS PERSONAL ATTENTION
- TRIGGERS ACTION.

After your prospect has been convinced by DISPLAY ADVERTISING, he still must take one giant step. *He must act.* A personalized mailing piece direct to his desk, in conjunction with a display campaign, is a powerful action getter.

McGraw-Hill has a Direct Mail Division ready to serve you with over 150 specialized lists in the Industrial Field.

To get your copy of our free INDUSTRIAL DIRECT MAIL CATALOGUE (1954) containing complete, detailed information about our services, fill in the coupon below and mail it to McGraw-Hill.

Do it now! The best advertising programs are planned well in advance.

Direct Mail Division,
McGraw-Hill Publishing Co., Inc.
330 West 42nd St., N. Y. 36, N. Y.

Please forward my free copy of the McGraw-Hill "Industrial Direct Mail Catalogue."

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COMPANY_____

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Consulting Engineers
Coal Mine Operation, Preparation
Prospecting and Development
Property Valuation
Oliver Building — Pittsburgh 22, Pa.

ALLEN & GARCIA COMPANY
42 Years' Service to the
Coal and Salt Industries and Consultants
Constructing Engineers and Managers
Authoritative Reports and Appraisals
332 S. Michigan Ave., Chicago
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GEO. S. BATON & COMPANY
Consulting Engineers
Cost Analysis — Valuations
Mine and Preparation Plant Designs
1100 Union Trust Building — Pittsburgh 19, Pa.

EAVENSON, AUCHMUTY & SUMMERS
MINING ENGINEERS
COAL OPERATION CONSULTANTS
VALUATION
3720 Koppers Bldg. — Pittsburgh 19, Pa.

HENRY O. ERB
COAL PREPARATION CONSULTANT
Plant design and Operation
Sales Engineer for
"WANUCO" Water Neutralizing Process
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Telephone 5721 — Beckley, W. Va.

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30 Years
Continuous Consulting Service
to Coal Mines
Telephone HArrison 7-5151
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Registered Professional
Consulting Mining Engineer
47 Years Experience as
Engineer and Supervisor
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Application—Supervision of Installation
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POWER-HAULING HOISTING VENTILATION
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CONSULTING ENGINEER
Layout — Operation
Modern Production Methods
Plant Design — Preparation
120 S. La Salle St. — 925 E. Noel Ave.
Chicago 3, Ill. — Madisonville, Ky.

TEMPLETON-MATTHEWS CORPORATION
Designing Engineers — Consultants — Builders
MODERN COAL PREPARATION PLANTS THRU "CO-OPERATIVE ENGINEERING"
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J. PIERRE VOGEL
COAL INVESTIGATION — COAL PREPARATION
COAL STRIPPING
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PITTSBURGH 22, PENNSYLVANIA

PAUL WEIR COMPANY
MINING ENGINEERS and GEOLOGISTS
CONSULTANTS and MANAGERS
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J. W. WOOMER & ASSOCIATES
Consulting Mining Engineers
Modern Mines Systems and Designs
Foreign and Domestic Mining Reports
National Bank Building — Wheeling, W. Va.
Henry W. Oliver Bldg. — Pittsburgh, Penna.

WANTED

Assistant Superintendent in a combined Mechanical and Electrical Department of a long established underground mining operation in East Tennessee.

Successful applicant should have had several years experience in maintenance, and preferably, but not necessarily, be a technical graduate in Electrical Engineering.

Climate and living conditions are excellent. Give details of work experience, and include at least three references as to character and ability. Salary open.

P 3272 Coal Age
330 W. 42 St., New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS WANTED

ENGINEER - MANAGEMENT-operation, ability in evaluation, development, latest mech-methods of underground and surface mining, strong in production-capital cost. PW 3760, Coal Age.

BSEE, 5 Yrs. experience in open-pit mining operations, maintenance, and engineering. Desires position as maintenance supervisor or project engineer. PW 3730, Coal Age.

MINING GRADUATE, 28, 4 years with large coal producer, 2 years Project Engineer on layout, design, construction of coal and mineral beneficiation facilities. Require responsible position with mining or engineering firm. PW 3731, Coal Age.

WANTED

ANYTHING within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

SEARCHLIGHT SECTION

Classified Advertising

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED
$1.20 a line. Minimum 3 lines. To figure advance payment count 5 average words as a line.
Positions Wanted undisplayed advertising rate is one-half of above rate, payable in advance.
Box Numbers Count as one line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Individual Spaces with border rules for prominent display of advertisements.
The advertising rate is $10.20 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
An advertising inch is measured ⅞" vertically on one column, 3 columns—30 inches—to a page.

NEW ADVERTISEMENTS: Address N.Y. office, 330 W. 42 St., N.Y. 36, for Oct. issue, Closing Sept. 17th

-TRANSFORMERS-

BOUGHT AND SOLD

We carry a large stock of transformers, and invite your inquiries. New Transformers built to your specifications.

PIONEER TRANSFORMER REBUILDERS

We rewind, repair and redesign all makes and sizes. One Year Guarantee.

THE ELECTRIC SERVICE CO., INC.
"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
SINCE 1912 — **CINCINNATI 27, OHIO**

Wanted—

Second hand coal & charcoal briquetting press in good operating order, capacity 1 to 3 tons per hour, price.

W3584 Coal Age
330 W. 42 St., New York 36, N. Y.

Ironton Electric Locomotives
New and used.
The Ironton Engine Company
Farmingdale, New Jersey

THINK OF J. T. FISH FIRST

Whether you're buying or selling mining machinery and equipment, J. T. FISH is the firm you will want to do business with.
No matter what you have to sell—tipples, loaders, cutters, cut trucks, rail, copper, etc. J. T. FISH is always in the market.
And, if you use mining machinery, rails, copper or supplies of any kind in your operation, you can count on J. T. FISH for an unfailing source of supply at year-round bargain prices!

WE OWN WHAT WE ADVERTISE

All types of Joy Cutters, Loaders, Shuttle Cars, Cut Trucks, Belt Conveyors, Chain Conveyors, etc. Includes

1—Jeffrey 29U rubber tired Cutter.
1—Joy Continuous Miner, low vein.
2—14-BU low pedestal Loaders, 10 H.P. motors, type 7 AE.
2—14-BU, med. pedestal Loaders, 10 H.P. motors, 7 RBE.
2—14-BU, 3 PE, med. pedestal Loaders, 7½ H.P. motors.
1—12-BU, 9E latest type Loader.
2—8-BU Loaders, one 33½" high.
2—11 BU Joy Loaders, hi capacity.
2—Joy T2-5 Cat Trucks, low pan, 1—T2-6.
1—Joy T1 Standard Cat Truck.
1—Goodman 20" Belt Conveyor, 1000' centers.
2—Joy 30" Belt Conveyors, 1000' & 2000' centers. Like new.
4—Joy 11B low vein Cutting Machines, 35 and 50 H.P.
6—Jeffrey 35L Cutting Machines, 230 volt DC.
2—Joy 6 BC four wheel drive Shuttle Cars, rebuilt. Elevated discharge.
2—Joy 5 GC four wheel drive Shuttle Cars.
4—32E15 Shuttle Cars, all hydraulic.
4—32E Shuttle Cars, as is or rebuilt.
10—32E9 Shuttle Cars, as is or rebuilt.
2—Joy PL11-14 Elevating Conveyors, rebuilt.
2—Joy Belt Feeders PL12.
3—Myers Whaley No. 3 Automat Loaders.
Jeffrey L-500 Loaders.
Goodman 360 Loaders.
Cedar Rapids portable 3 track tipple complete with conveyors. Like new.
General Electric & Westinghouse Rotary Converters & M.G. Sets, 100 to 300 KW, latest types.
4—G.M.C. & Caterpillar 75 and 100 KW Diesel Plants, 250 DC Volts.
6—Goodman 512EJ Cutting Machines.
3—Baby Goodman 212AA Cutting Machines.
Jeffrey 35L, 35B, 29C, 29L Cutters.
Locomotives of all types in stock.
4—Brown Fayro HKL Car Spotters.
2—HGD Hoists, Brown Fayro.
1—Hi-pressure large capacity MSA Rock Duster.
2—MSA portable Rock Dusters.
Incline Hoists, all types.
5—Water Cars, like new.
Mine Cars, Drop Bottom & End Dump 42", 44" & 48" track gauge.
Car Retarders—Beam Hoists.
1000 G.I. 5 Gal. Gas & Water Cans.
Transformers, all sizes & voltages.
Joy and Jeffrey 12" & 15" Chain Conveyors.
Shaker Conveyors, Goodman & Joy.
Crushers and Vibrators.
Conveyor Belting 26" & 30" for all purposes.
16 Yd. Dragline Bucket.
Hardsoog Horizontal Drill.
Quickway Truck crane and Shovel.
Copper Trolley & Feeder Wire, all types.
Relaying Rail, all sizes.
Mine Scales and Truck Scales.
Stationary Motors, AC and DC.
300 H.P. Natural Gas Engine.
Alternator 2300 volt, 200 KW.

Thousands of other Items

We Buy — Sell — Trade ***Send Us Your Inquiries***

J. T. FISH & COMPANY

LOGAN, WEST VIRGINIA ... PHONE — 2825

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Tons 18" to 56½" Track Gauge.
GREENSBURG MACHINE CO.
Greensburg, Pa.

---

2 TELEPHONES $22.75

Inter-communication handsets, two wire system. Included Two 3 volt batteries, 50 ft. of wire and simple wiring instructions. Additional wire 1 cent per ft. or $25.00 per mile. Complete list of telephone parts, handsets, magneto—common battery — and dial telephones, switchboards, etc. Write:

Telephone Engineering Co., Dept. 9F4, Simpson, Pa.

Practically new $25,000.00—15-ton Goodman Locomotive for only $8500.00, specifications as follow:

1—15-ton Goodman Locomotive, Ser. No. 5583
Two (2) Motors, Type 81-A-04-C, 120 HP each, 250 V DC
Contactor Controller Type LM98E
Wheel base ..... 72"
Overall height ..... 43"
Width overall ..... 62"
Overall length ..... 16'
Inside steel tired wheels ..... 33"
Outside armorplate frame ..... 4"
Track gauge ..... 42"
Timken roller journal bearings
Equipped with HYDRAULIC BRAKES and CONTACTOR CONTROLS, equalizers, gear cases, brand new steel strip resistances, and one extra brand new armature.

300—Sanford-Day, 42" gauge, all steel Rotary Dump Mine Cars, 14" Timken bearing wheels, height from rail 40", outside length 12', width outside bed 6', length overall including semi-automatic couplings 14', level full capacity 4 tons.
Cost new in 1948—$900.00 each. Bargain for only $225.00 each. In practically new condition.

1—Roberts & Schaefer Rotary Mine Car Dump, push button controls, with 2 5-10 HP Westinghouse variable speed motors, 3 phase, 60 cycle, 440 V.

212—Practically new 7-ton American Car & Foundry Company all steel 1-2-3 Drop Bottom Mine Cars
Track gauge ..... 48"
Overall length ..... 14'
Overall width ..... 7'
Overall height on loading ends .. 40"
Overall height ..... 48"
Axles ..... 3½"
Timken roller bearing CAST STEEL wheels ..... 16"
Heavy steel sides and heavy construction throughout.
Cost new in 1950 approximately $1280.00 each. Bargain for only $325.00 each.

Above equipment offered subject to immediate inspection and prior sale.

Many late type 8BU, 14BU, and 11BU, 250 V DC, permissible type Joy Loading Machines and 6SC, 5SC, and 42E Shuttle Cars.

Several Single and Double Drum Slope, Drift and Shaft Hoists with 300 HP to 1300 HP motors. Coal Washers, Bradford Breakers, complete 4 and 5-track Steel Tipples and many other items too numerous to mention. Send us your inquiries and get our low prices on any items you may need.

COAL MINE EQUIPMENT SALES COMPANY

Frank J. Wolfe **Phone L. D. 34** **Sheldon J. Wolfe**
Terre Haute, Indiana

TRANSFORMERS (1 ph. 60 cy.)

KVA	MAKE	Pri. V.	Sec. V.	Qs.
200	Pgh.	22000	220/440	3
125	West.	11000	2300	3
100	Davis	2300/4000	230/460	3
75	G.E. (Pyranol)	2400/4160	120/240	3
50	Allis	2500	115/230	3
50	G.E.	2300	230/460	3
37½	G.E.	11000	230/460	3
25	G.E.	2300/4160	230/460	3

MOTOR GENERATOR SETS

400 KW West. 550 v. 720R-Sys.-SK 2300/4000 v.
300 KW West., 275 v. 1200 R-Sys. 2300 v.
300 KW G.E. 275 v. 1200 MPC-ATI 2300/4000 v. Full automatic.
200 KW G.E. 275 v. 1200-MPC-ATI 2300/4000 v.
200 KW Ridg. 275 v. 900R-Sys. 2300 v.
150 KW G.E. 275 v. 1200 R MFC-ATI 2300/4000 v.
100 KW Ridg. 275 v. 1200R-Sys. 2300 v.
75 KW G.E. 275 v. 1200R. MPC-Sq. Cg. 440 v.
50 KW GE 275 v. 1200R. MPC-Sq. Cg. 2300/440 v.
35 KW G.E. 125 v. 1750 R. RC-KT 220/4-0 v.

ROTARY CONVERTERS

2—500 KW G.E. 275 v. HCC6-1200R. 13,200 v.
300 KW G.E. 275 v. HCC6-1200R. 2300/4000 v.
300 KW G.E. 275 v. HC12-600 R. 2200/400 v.
300 KW West. 275 v. 1200 R. 2300/4000 v.

Will rewind transformers to your specifications
AC & DC REBUILT MOTORS—Any size

MOORHEAD ELECT. MACH'Y CO.

P.O. Box 7991C — Pittsburgh 16, Pa.

OFFERED BY
LARGE COAL COMPANY
PRICED TO SELL

CUTTER—SULLIVAN 7 BU
LOADER—GOODMAN 460
ELEV. CONVEYOR—JOY P 11
LOCOMOTIVES—6, 8 & 10 tons
SHOVEL CAR—JOY 42-D
GREASE TRUCK—LEE NORSE MT 6

Write F. S.—3778 Coal Age
330 W. 42 St., N. Y. 36, N. Y.

DIESEL ENGINES • GENERATOR SETS

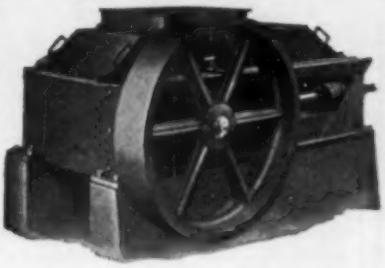
10 TO 2000 KW • AC & DC • GUARANTEED
"We Own What We Offer"
A.G. SCHOONMAKER CO., INC.
50 CHURCH ST. NEW YORK 7, N. Y.
Plants: SAUSALITO (S. F.) CAL., JERSEY CITY, N. J.

2—11BU-7E Joy Loading Machines, w/Serial #5035 and 5059
1—11BU-8PE Joy Loading Machine, w/Serial #5173 (Hyd. Pump in bumper)
3—29U Jeffrey Cutting Machines, Rubber/mtd., Serial Numbers: 25142; 21569 & 24594
1—DAA-1 Baker-Fletcher Roof Control Drill, Serial #52, 4/24" Cir. Saw/attached & spare BT-103 Unit w/hyd. Motor Swivels, Rubber mtd.
1—G. E. 300 KW M-G set with Switch Gear, Completely Automatic, Portable, 1200 RPM, 4000/2300 volts, #1862521
1—10-Ton G.E. Loc., Type HM 8306 (Haulage) Serial #10419
1—8-Ton Jeffrey Loco., Type MH 100 (Cable Reel) Serial #2450
1—8-Ton Jeffrey Loco., Type MH 106 (Cable Reel) Serial #5712
1—8-Ton G.E. Loco., Type HM 819 (Cable Reel) Serial #6687
1—#M44088 BANTAM High Pressure Rock Duster, MSA, Approved by U. S. B. of Mines, w/230V DC Whse. Motor and 50' 2" hose.
1—#82235B Worren Pump, 3" Discharge, 4" Suction, Dia. of Impeller 15¼", Impeller #HA491 (s), w/50 HP G.E. Motor, Type C.D. 1750 RPM, #1779338, 230V
1—Weinman Pump, 6x6, Serial #112666, W/ Motor #499921, 50 HP, 1050 RPM & Control Panel, 230 V DC
1—B. F. Goodrich Tire 12.00-20 & Tube H/D
1—Metalizing Gun Type 2-E
1 set Metalizing Gages #G-10 & G-200
1 lot AC & DC Motors, 2 to 75 H.P.

Phone 301 Shinnston, W. Va.

FARLAND FUEL CO.

Rt. #1, Shinnston, W. Va.



COAL CRUSHERS

1—18" x 18" Jeffrey single roll
1—24" x 24" Jeffrey single roll
1—24" x 36" McNally-Pittsburg double roll
1—36" x 42" double roll
1—30" x 16" Williams pulverizer
1—36" x 48" Jeffrey hammermill

TUGGER & SLUSHER HOISTS

1—5 HP Brownie room hoist
1—5 HP Sullivan RH room hoist
1—7½ HP Sullivan double drum slusher hoist
2—10 HP Sullivan 3 drum slusher hoist
1—Ingersoll-Rand mod. 6HC air tugger hoist
2—6½ HP Sullivan tuggers, 250 v. DC
7—6¼ HP Sullivan double drum, 250 v. DC
1—10 HP Sullivan double drum driven by Continental gasoline engine

BOX CAR LOADERS

3—Ottumwa 20 HP box car loaders
2—Manierre 22 HP box car loaders
1—Jeffrey 20 HP box car loader
2—Red Devil portable loaders, 12'x15"
1—Card portable loader, 11'x19"

SCRAPER CONVEYORS

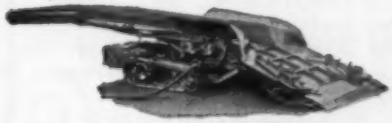
1—Link Belt, 50' centers, 12" flights
1—Jeffrey, 75' centers, 9" flights
1—Jeffrey, 67' centers, 30" flights
1—Jeffrey, 70' centers, 30" flights
1—Jeffrey, 72' centers, 30" flights
1—Jeffrey, 88' centers, 36" flights
1—Jeffrey drag, 28' centers, 9" drags
1—Jeffrey drag, 26' centers, 30" drags

ROTARY DUMPER

1—Card rotary car dumper, 13'x5' platform

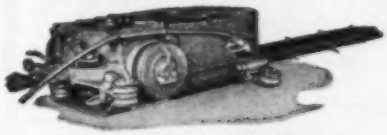
ELECTRIC HOISTS

1—11 HP Vulcan #0 single drum
1—20 HP Vulcan single drum
1—22 HP Vulcan double drum
1—25 HP Vulcan single drum
1—30 HP Vulcan single drum
1—37 HP single drum
5—50 HP single drum
2—60 HP single drum
4—100 HP Box single drum
1—112 HP Vulcan single drum
1—145 HP Vulcan single drum
2—150 HP Vulcan single drum
1—375 HP Box Single Drum Hoist, 800 FPM with 375 HP GE Slipring Motor, 575 RPM, complete with controller, grids and magnetic contact panel.
1—600 HP Box Single Drum Hoist, 25,000# Rope Pull, 900 FPM, Hydraulic Post Breaks with 600 HP Westinghouse Slipring Motor, 435 RPM, controls and magnetic contact panel.



LOADERS & CONVEYORS

1—8BU Joy loader
1—61EW Jeffrey elevating chain conveyors
1—61HG Jeffrey chain conveyor, 90'
1—61W Jeffrey chain conveyor, 200'
9—G-20 Goodman shaker conveyors
6—G-15 Goodman shaker conveyors
8—Vulcan shaker conveyors
2—Joy ladel UN-17 shaker conveyors
10—Goodman HA duckbills



MINING MACHINES

2—7B Sullivan super short wall coal cutters
18—CE7 Sullivan coal cutters
1—CR3 Sullivan coal cutter
1—Jeffrey 28A coal cutter
6—Goodman 112-A coal cutter
1—Sullivan CH-11 ironclad shearing machine
1—Jeffrey 29-C Arcwall coal cutter

SCALES

3—100 ton Fairbanks railroad scales
1—100 ton Howe railroad scale
1—125 ton Howe railroad scale
1—5000# Fairbanks Tipple scale with weighing basket
1—5000# Howe Tipple scale

SCREENS

5—3'x5' Tyler "Hummer" electric vibrating screen
1—42"x72" Jeffrey-Traylor electric vibrating screen
1—48"x84" Jeffrey-Traylor electric vibrating screen
1—40"x100" Tyler-Niagara 2 deck shaking screen
2—4'x12' Tyler Ty-rock 3 deck shaking screen
1—2 deck shaking screen, 18'x86"
1—4 deck shaking screen, 32'x84"

PIT CARS

125—60 cu. ft. Card steel coal mine cars 36" ga.
88—66 cu. ft. Card steel coal mine cars 36" ga.

SHUTTLE CARS

2—Joy Shuttle Cars, Model 42D5.

RAIL

We have in stock good relaying rail, 16# to 90# also new 16# to 20# with fittings.

STORAGE BINS

2—50 ton capacity steel bins

CAGES AND HEAD SHEAVES

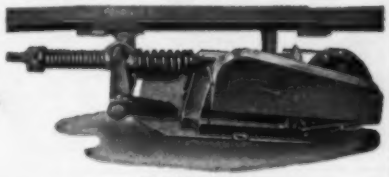
2—Card automatic self-dumping cages, 5'4" x 9'6" platform
2—108" Card bicycle sheave wheels
2—96" wood filled sheaves
2—84" Card bicycle sheave wheels
3—72" bicycle sheave wheels

MINE FANS & BLOWERS

2—8-H Jeffrey 42" Aerodyne fans
1—7' Jeffrey Aerovane 2 stage fan
2—Jeffrey #61 exhaust blowers
7—Jeffrey Aerodyne midget blowers
1—2600 cfm Brown-Fayro exhaust blower
2—3000 cfm Claridge exhaust blowers

PICKING TABLES

1—Link-Belt, 20' centers, 18" pans
1—Card, 41'6" centers, 30" pans
1—Card, 51' centers, 48" pans
1—73' centers, 30" pans
1—64' centers, 48" pans



ELEVATORS

1—Link-Belt, 42' centers, 6"x4" buckets, single chain, complete with steel housing
1—Link-Belt, 36' centers, 18"x8" buckets, double chain
1—12' centers, 14"x7" buckets on belt
1—35' centers, 10"x5" buckets on belt

BELT CONVEYORS

1—Jeffrey 24"x13'
1—Barber-Greene, 24"x66'
1—Barber-Greene, 24"x135'
1—Barber-Grene, 30"x173'

LOCOMOTIVES

1—2 ton Whitcomb, battery, 24" ga.
2—2½-3½ ton Mancha battery, 24" ga.
1—4 ton Westinghouse-Baldwin battery, 24" ga.
1—4 ton Ironton, battery, 36" ga.
2—7 ton G.E. permissible battery, 36" ga.
1—7 ton Atlas, battery, 36" ga.
3—8 ton Ironton battery, 36" ga.
2—8 ton G.E. battery, 36" ga.
2—8 ton Goodman battery, 36" ga.
4—10 ton Atlas battery, 36" ga.
1—3 ton Whitcomb gas engine driven, 24" ga.
1—2½ ton Jeffrey trolley, 36" ga.
1—4½ ton Goodman trolley, 36" ga.
1—5 ton Jeffrey trolley, 36" ga.
1—6 ton Goodman trolley, 36" ga.

Send for free copy of illustrated booklet describing the famous Allen Lamp collection.

Since 1898 Dependable Reconditioned Machinery

MORSE BROS. MACHINERY CO.

2900 BRIGHTON BLVD. **EST. 1898** **DENVER 1, COLO.**

COAL AGE ADVERTISERS IN THIS ISSUE

MORE INFORMATION on any product advertised in COAL AGE may be easily secured by using the postage-free card facing p. 133.

SEARCHLIGHT SECTION

(Classified Advertising)

H. E. Hilty, Mgr.

ADVERTISERS INDEX

This index is published as a convenience to the reader. Every care is taken to make it accurate, but C. A. assumes no responsibility for errors or omissions.

SEE RUST-OLEUM APPLIED DIRECTLY OVER SOUND RUSTED SURFACES! MAKE THIS TEST UNDER YOUR OWN CONDITIONS AND SEE PROOF OF PERFORMANCE!

See Rust-Oleum 769 Damp-Proof Red Primer actually applied over a badly rusted surface after simple scraping and wire-brushing to remove rust scale and loose rust in the Rust-Oleum *"rusted panel demonstration."* Rust-Oleum's specially-processed fish oil vehicle *penetrates* rust to bare metal usually eliminating sandblasting and other costly surface preparations.

Rust-Oleum finish coatings in Aluminum, Green, White, Gray, Yellow, Black, Orange, Blue and others provide both *Rust Prevention* and *Decorative Beauty!* Specify Rust-Oleum for new construction, maintenance, and re-modeling. See Sweets for complete catalog and nearest Rust-Oleum Industrial Distributor, or attach coupon to your business letterhead.

RUST-OLEUM®

STOPS RUST!

There Is Only One Rust-Oleum. It Is Distinctive as Your Own Fingerprint. Resists Rain, Sun, Fumes, Snow, Heat, Salt Air, Salt Water, etc.

See local classified telephone directory under Rust Preventives or Paints for nearest Rust-Oleum Industrial Distributor.

ATTACH TO YOUR BUSINESS LETTERHEAD AND MAIL TO:
Rust-Oleum Corporation, 2463 Oakton St., Evanston, Ill.

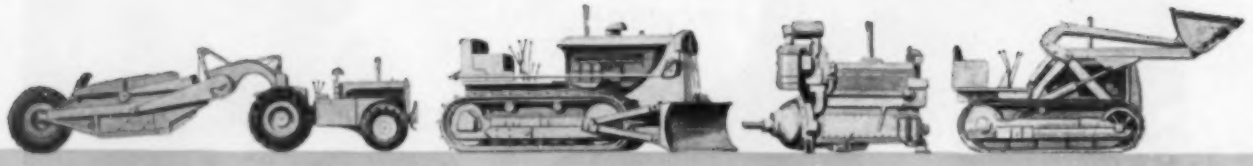
- ☐ Please Show Me the Rust-Oleum "Rusted Panel Demonstration."
- ☐ Test Application of Rust-Oleum Over Rusted Metal Surfaces in My Plant.
- ☐ Complete Literature with Color Chart.
- ☐ Nearest Rust-Oleum Industrial Distributor.

In the market for used equipment?

DON'T BUY A "PIG IN A POKE"

Only your Caterpillar Dealer offers "BONDED BUY" in used machines to do more work at less cost

BONDED BUY



You know what you're getting when you buy used heavy-duty equipment from your Caterpillar Dealer. Only your Caterpillar Dealer gives you a selection of machines in three clear-cut classes for all phases of mine and quarry work: stripping, haul road construction and maintenance, pioneering, materials handling, compressor and jumbo drill work, etc.

A $10,000 GUARANTEE says that your best buy is a "BONDED BUY." It's available only on Caterpillar equipment, and only from your Caterpillar Dealer.

Next best selections are "Certified Buy" and "Buy and Try" —both guaranteed in writing by your dealer. These cover used machines of any make.

Every item on your Caterpillar Dealer's lot—engine, tractor, motor grader, earthmoving equipment and other machinery—is honestly tagged in one of these three classes, and backed in writing.

Whether you want one machine, a few, or many, your Caterpillar Dealer is your best source of new and used equipment. He posts a bond only on used Caterpillar-built equipment because he can count on—and *you* can count on—the traditional ruggedness and long, trouble-free work life of these husky yellow machines. See him for full details on this *exclusive* across-the-board guarantee. Do it today, while his selection is at its peak!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

REG. U. S. PAT. OFF.

BEST BUYS IN NEW AND USED EQUIPMENT

DON'T GUESS OR GAMBLE—
Only your Caterpillar Dealer offers a $10,000 bond on used equipment

Your Caterpillar Dealer offers you three clear-cut classes of used equipment. He backs each one in writing. You buy with confidence, sure that the equipment is honestly described. See him for the best values on the market!

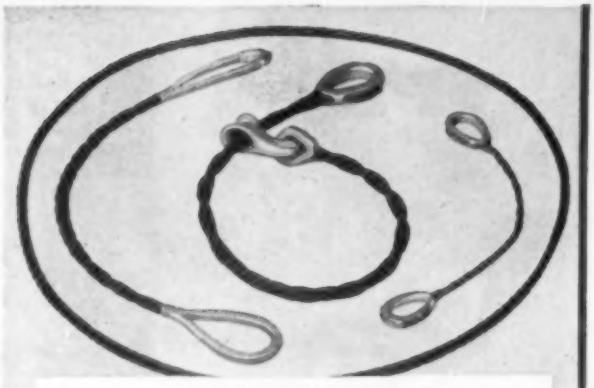
(1) "BONDED BUY." Only the best in used Caterpillar-built equipment. Each "BONDED BUY" machine is backed by a Dealer's Guarantee Bond equal to the purchase price of the machine up to a maximum of $10,000. This provides a guarantee for thirty days against unsatisfactory performance due to defective parts. If a part should prove defective within the guarantee period under the normal conditions of your job and with proper maintenance, your dealer will put your machine back into operating condition *with no charge to you for parts and labor* up to the amount of the bond. The Dealer's Guarantee Bond is backed by The Travelers Indemnity Company. Your Caterpillar Dealer gives you this protection, at no cost to you, with your purchase of a "BONDED BUY" machine. Look for the "BONDED BUY" symbol —your assurance of the best in used equipment.

(2) "CERTIFIED BUY." This is your next best buy in used equipment. "Certified Buy" covers machines of any make in good condition. Your performance guarantee is in writing backed by your Caterpillar Dealer.

(3) "BUY AND TRY." Bargains in used machines of any make. Buy and try them for a period mutually agreed upon by you and your Caterpillar Dealer. "Buy and Try" machines carry his written "money-back" agreement.

"BONDED BUY" assurance effective in the United States and Canada

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



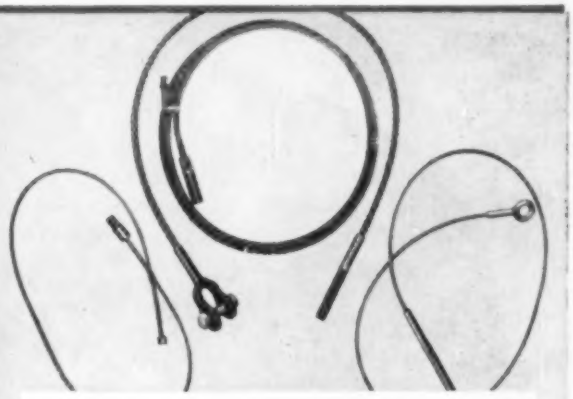
Braided Wire Rope Slings

Materials handling—from unloading a car of pipe to handling a 200-ton generator—requires a wide variety of safe, economical, easy-to-handle slings. The sizes and types of Macwhyte Slings are practically unlimited—they are available in many standard designs or can be custom-made. Bulletin lists and illustrates many types and body styles in Round-Braided, Flat-Braided and Single-Part Slings. *Specify Bulletin 5308.*

The proper choice from this wide variety of wire rope products means — LONGER and SAFER SERVICE

Wire Rope

Proper selection of wire rope is most important in getting safe, economical operation. To provide the right ropes for each of the many kinds of equipment, Macwhyte Company makes a thousand and one types and sizes. Included are PREformed Internally Lubricated Ropes, Galvanized Ropes, Stainless Steel, and Monel Metal Ropes. *Request Catalog G-16.*



Wire Rope Assemblies

Safe-Lock Wire Rope Assemblies provide a unit of wire rope with permanently attached fittings made to specified size, length, and strength needed. A wide selection of fittings and wire rope are made for use on small gasoline powered equipment; outboard motors; mining and excavating machines; agricultural implements; automotive, aircraft, marine, and laboratory equipment. *Ask for Catalog 5201.*

Recommendations for the correct wire rope product for your needs will be gladly furnished.

MACWHYTE

MACWHYTE COMPANY
2931 Fourteenth Avenue
Kenosha, Wisconsin

Manufacturers of Internally Lubricated PRE-formed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Galvanized, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies.

Mill Depots:
New York · Pittsburgh · Chicago
St. Paul · Ft. Worth · Portland
Seattle · San Francisco · Los Angeles

PROOF: 9 more mines report:

Multi-Louvre Dryers are unmatched for efficient heat-drying of coal

1 ILLINOIS

Reduces surface moisture of slurry from 12% to 1%. Mine now markets product from its slurry dump.

2 WEST VIRGINIA

Pocahontas No. 3 Seam

Only one man attends four dryers. Output: 460 tph of ¾" x 0" metallurgical coal.

3 INDIANA

No. 5 Seam

Easier shipping and storage of ⅜" x 0" product because Multi-Louvre efficiently reduces surface moisture.

4 KENTUCKY

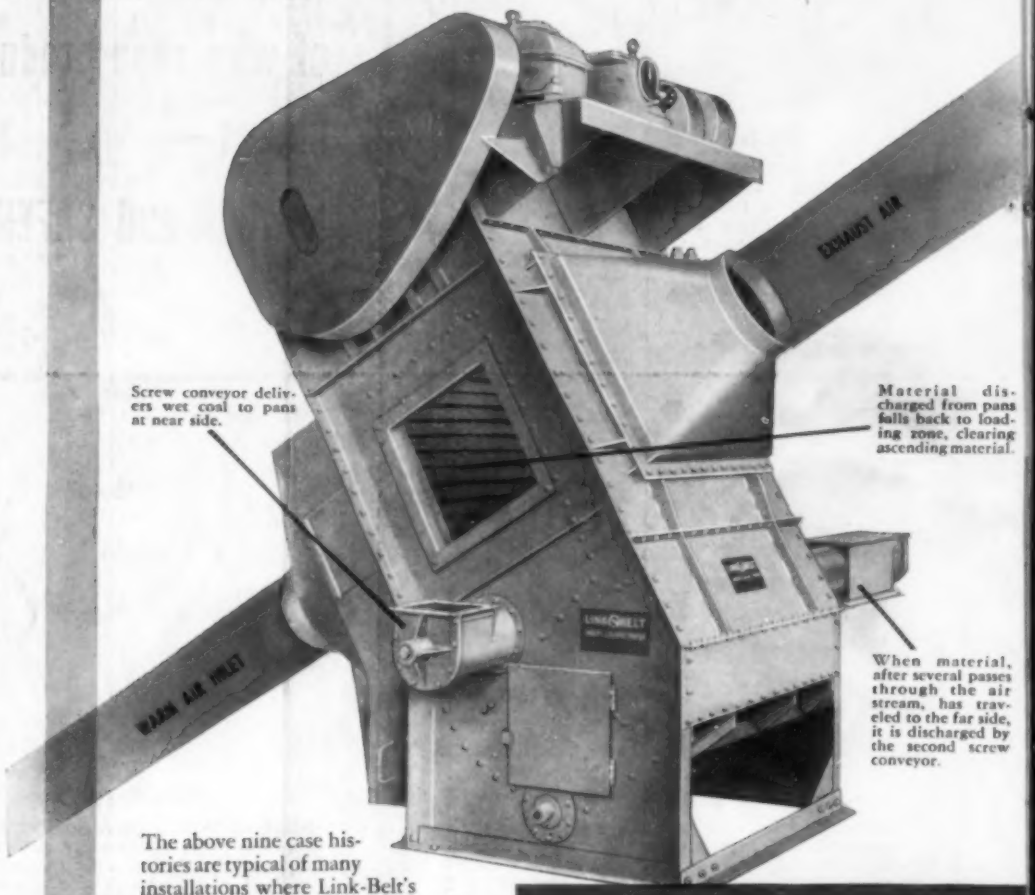
Elkhorn No. 3 Seam

Metallurgical coal retains coking qualities as two Multi-Louvres dry ¼" x 0" washed coal.

5 WEST VIRGINIA

Eagle Seam

Dries wide range of sizes—250 tph of 1½" x 0" coal, yet coal discharge temperatures are less than 120° F.



The above nine case histories are typical of many installations where Link-Belt's Multi-Louvre is heat-drying coal successfully. Wherever used in the coal mining industry, this dryer provides an economical means of producing a better and more acceptable product to meet increasingly critical markets. For complete information, call the Link-Belt office near you, or write for Book 2466.

LINK-BELT

COAL PREPARATION AND HANDLING MACHINERY

LINK-BELT COMPANY: Chicago 9, Birmingham 3, Cleveland 15, Denver 2, Detroit 4, Huntington 9, W. Va., Indianapolis 6, Kansas City 8, Mo., Louisville 2, Pittsburgh 13, Seattle 4, St. Louis 1, Wilkes-Barre, Scarboro (Toronto 13), Springs (South Africa).

6 ILLINOIS

No. 6 Seam

Helps recover marketable fuel formerly wasted. Low power consumption cuts operation costs.

7 KENTUCKY

No. 11 Seam

Increases dry cleaning efficiency by turning out a product of uniformly low moisture content.

8 ILLINOIS

No. 6 Seam

High capacity — 140 tph — makes this Multi-Louvre a profitable investment for preparation plant.

9 WEST VIRGINIA

No. 5 Block Seam

Degradation is minimized as two Multi-Louvre dryers reduce surface moisture of two sizes to 2.0%.